



ROBERT FULTON

ALICE CRARY SUTCLIFFE



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TRUE STORIES OF GREAT AMERICANS

ROBERT FULTON



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ROBERT FULTON.

From a miniature owned by Mrs. R. Fulton Blight.

ROBERT FULTON

BY

ALICE CRARY SUTCLIFFE

GREAT-GRANDDAUGHTER OF ROBERT FULTON
AUTHOR OF "ROBERT FULTON AND THE *CLERMONT*"
AND "THE HOMESTEAD OF A COLONIAL DAME"



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PREFACE

ON board the fine passenger boat, *Robert Fulton*, one of the several queen steamers of the Hudson River Day Line, on a May morning when the beauty of the incomparable river spread in calm perfection before contented eyes, a great-granddaughter of Robert Fulton began to write, for young readers, this story of the steamboat inventor's life.

No "Hero of America" may lay more just claim to the title than Robert Fulton, the fearless, persistent lad of Pennsylvania. His boyhood of stern self-denial, his struggle for culture and advanced education, and his constant industry place him in "the rank and file" of all students who may read this book with the desire to learn his secret of success.

Fulton's story reveals it. He solved problems locked from the knowledge of man by a faithful use of the key of *hard work*. Born on a lonely farm in the country, deprived in early childhood of his father's loving care, he earned his own

living and carved his path to fame and fortune. Therefore his progress is typical of possible similar achievements for all young Americans who wish to render good service to their country and to their fellow-men.

In writing the story of a man whose work for the world has won fame, the seeker for historic fact must patiently piece together the threads gathered from many sources to weave the fabric of connected truth.

For these facts concerning Robert Fulton's life I have searched during a period extending over several years. In presenting this volume I desire to acknowledge my indebtedness to the several biographers who, during the century since his death, have traced his eventful career: Cadwallader D. Colden (1817); J. Franklin Reigart (1856); Thomas W. Knox (1886); Robert H. Thurston (1891); Peyton F. Miller (1908); and, most valuable because most recent and therefore most comprehensive, H. W. Dickinson in "Robert Fulton, Engineer & Artist" (1913). Also am I indebted to the Historical Societies of Chicago, New York, and Pennsylvania; the Library of Congress; the Estate of Cornelia Livingston Crary; the Hon. Peter T. Barlow; Messrs. Louis S. Clark, Newbold Edgar, Charles Henry Hart, John Henry Livingston, Robert Fulton Ludlow, Mrs. Frank

Semple, and Mrs. George Montgomery, individual owners of the inventor's original manuscripts and letters shown at the Robert Fulton Relic Exhibit, during the Hudson-Fulton Celebration of 1909, gathered jointly by the New York Historical Society and the Colonial Dames of America, of which latter organization the writer served as chairman of the Hudson-Fulton Committee.

From this vast mass of data is the present modest volume built, — a tale retold for the boys and girls of America, whose lives, through the inspiration of famous men and women, may in future years provide records of equal worth for historians.

ALICE CRARY SUTCLIFFE.

NEW YORK CITY,
November 7th, 1914.



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A child of Lancaster, upon this land
Here was he born by Conowingo's shade ;
Along these banks our youthful Fulton strayed
Dreaming of Art. Then Science touched his hand,
Leading him onward, when, beneath her wand,
Wonders appeared that never more shall fade :
He triumphed o'er the Winds and swiftly made
The giant, Steam, subservient to command.

How soft the sunlight lies upon the lea
Around his home, where boyhood days were sped !
These checkered shadows on the fading grass
Symbol his fortunes, as they fleeting pass :
"He did mankind a service," — could there be
A tribute more ennobling to the dead !

LLOYD MIFFLIN.

ROBERT FULTON

CHAPTER I

AN OLD-TIME FOURTH OF JULY

AMERICAN Independence was young in 1778, — only two years old. The patriotism awakened by the Liberty Bell in Philadelphia was active as this second anniversary of our nation's birth approached, and sturdy Pennsylvanians, glad of our country's freedom from English rule, planned a Fourth of July celebration.

In Lancaster, less than seventy miles from Philadelphia, the wise men of the town council foresaw waste and tumult if the young patriots carried out the programme they had arranged. Upon the first day of July the Council discussed the matter and passed this resolution, which they publicly posted :

“The Excessive Heat of the Weather, the Present Scarcity of Candles, and Other Considerations, Induce the Council to Recommend to the Inhabitants to Forbear Illuminating the City on Saturday Evening Next, July 4th.

“By Order,

“TIMOTHY MATLACK, Secretary.”

We can imagine the disappointment of the Lancaster boys when they read this notice. Angry groups around the sign-board evinced their displeasure, and some of the bolder ones declared that they would light their candles anyway!

But one conscientious thirteen-year-old boy tried to think of some other method to show patriotism. As the town council forbade the use of candles, he would not disobey their law ; perhaps he could prepare a more novel celebration in honor of the holiday.

He had some candles which he had saved for the event ; now they were of no use. He therefore took them to a brush-maker who kept powder and shot for sale, and offered to trade them for gunpowder. The brush-maker, surprised that the boy would part with his candles when they were so scarce, asked his reason. The lad replied :

“Our rulers have asked the people not to illuminate their windows and streets. All good citizens should obey law, so I have decided instead to light the heavens with sky-rockets.”

The dealer, although amused, was glad to get the candles and promptly gave gunpowder in exchange. Then the boy went to another store, where he bought several large sheets of cardboard.

The clerk was about to roll the sheets for easy handling, but his customer protested:

"I wish to carry them as they are."

The curiosity of this man also was aroused. He remembered that the lad was said to be "always trying to invent something." As he handed them over he asked:

"What are you going to do with them?"

Eagerly the boy answered: "We are forbidden to light our windows with candles. I'm going to shoot my candles through the air."

"Tut! Tut!" exclaimed the man, laughingly. "That's an impossibility."

"No, sir," the boy responded, with a flash of enthusiasm. "There is nothing impossible."

This is a true story, told by an old-time Lancaster historian. The thirteen-year-old boy was Robert Fulton, who became the inventor of steam navigation.

It is good to carry the story further in imagination. That group of boys who gathered in the town during the twilight of Independence Day, 1778, saw a few spluttering rockets shoot skyward from the hand of a lad determined to carry the good news of freedom to a higher horizon than that of the home windows of Lancaster. A flash! A whirr! and the light arose, zigzagged its message through

the darkness, like fiery handwriting in the sky, and then died away. But the fine courage and courtesy of the boy who would not disobey a local law, although he felt a national appeal to patriotic jubilee, — these tokens of character have not faded. They prophesied the boy's success in life. He foretold it in his words, "Nothing is impossible."

Robert Fulton's father was one of three brothers, David, John, and Robert. They were of Scotch origin, and came to America from Kilkenny, Ireland, about 1730. Robert, the youngest, settled in Lancaster, Pennsylvania, where in 1759 he married Miss Mary Smith, daughter of Joseph Smith of Oxford Township, and bought for their first home a brick dwelling on the northeast corner of Penn Square, in the center of the town. In this house they lived until 1764. They took an active interest in local affairs, for Robert Fulton belonged to every organization then formed; to be sure, there were only three, for the town was small. He was secretary of the Union Fire Company, a charter member of the Juliana Library, and a founder of the Presbyterian Church.

It is pleasant to think of the young couple settling their new home on Penn Square (where not many years before the Indians had a colony), near a spring of clear water under a giant hickory tree.

It was on this very spot that the chieftains of "Hickory Tribe," as they termed themselves, met to confer with William Penn, the wise and kindly Quaker.

Governor Thomas Pownall visited Lancaster in 1754 and wrote that it was "a pretty and considerable town, increasing fast and growing rich." So we can be certain that when Robert Fulton's parents established a home of their own on Penn Square, they felt they had a bright future before them.

Two little daughters, Elizabeth and Isabella, were born to Mr. and Mrs. Fulton while they lived in this house and were among the first children to be christened in the new church. Mr. Fulton had a strong voice and was chosen to "lead the psalm" in the old Court House, where services were held until the church could be built. He sang the opening words of each division of the psalm and the congregation joined in unison for the later words.

In 1763 Mr. Fulton signed the charter for the town library, the third to be established in the American colonies. Thomas and William Penn, Esquires of the Province, drafted the papers and named the library "Juliana" after Thomas Penn's wife. He was a son of the famous old William Penn, who had conferred with the Hickory Indians,

and for whom the state of Pennsylvania had been named.

The new church, the Juliana Library, and the Union Fire Company, together with his business, kept Robert Fulton well occupied, but they yielded friendly comradeship and varied interests. In 1765 Mr. Fulton sold his Lancaster home and moved his family to a farm of more than three hundred acres on Conowingo Creek, in Little Britain Township, which he had purchased the preceding November. It lay sixty-five miles from Philadelphia, but not many from Lancaster, so they were not far from their friends, though they had to give up active work in the town.

The plastered stone farm-house to which the Fulton family moved is still standing by the country cross-roads. A wide sloping roof shelters the two-story building and overhangs a porch at the eastern end. There the ground slopes to the valley where the Conowingo Creek, a picturesque stream, flows on its quiet way to join the Susquehanna River. It is a place of great beauty and may well have proved attractive to early settlers. The low-ceiled parlors remain as they were during Mr. and Mrs. Fulton's occupancy, and the upper bedrooms show broad window sills of great age. The fireplace of the old-time kitchen also is unchanged, the

sturdy crane swinging in the sooty shadows where Mrs. Fulton hung her kettle to boil, in those distant days of pioneer life. Joseph Swift, of Philadelphia, wrote in after years that his grandmother "well remembered in her youth the preparations which a visit to Aunt Fulton required in the way of baking, boiling and roasting, and in getting ready the camp equipage which the journey through the wilderness required. It was only less formidable than a journey across the Atlantic."

It was in this quiet farm-house¹ that Robert Fulton, the inventor, was born on the 14th day of November, 1765. He was the first son and there was great rejoicing at his birth. During the cold winter days he slept by the open fireside while his mother attended to her household tasks and cared for the little daughters, — Peggy and Belle, as they were called, — who toddled about the baby brother's cradle. When the springtime threw its mantle of green over the fresh country-side, Robert laughed and grew strong in the clear country air.

Possibly farming did not pay, for during the succeeding year Mr. and Mrs. Fulton mortgaged the property to Joseph Swift and two others, arranging

¹ In 1909, a bronze tablet, commemorative of Fulton's birth, presented by the Lancaster County Historical Society, was unveiled at the entrance door, by the writer.

payments to be made during five years. When Robert Fulton finally moved his family back to Lancaster, Joseph Swift came to live in the house, now pleasantly shaded by a tall button-wood tree. This tree is said to have grown from a riding-whip which Joseph Swift's daughter, Esther, stuck into the ground one day as she dismounted from her favorite pony.

Although the Fulton family lived but a short time upon these farm lands, it gave a sufficient reason for a change of name in the township, for when Little Britain was resurveyed in 1844 the section containing the farm was entitled "Fulton Township," in honor of the baby boy who first saw the light under that sloping roof, on the bleak November day in 1765.

In selecting land near Conowingo Creek, the elder Robert Fulton realized — as his son came to realize in later years — the importance of water-courses and turnpike advantages. He continued upon the farm till 1771, when it was advertised for sale as "the place where Robert Fulton lives." But he died early in the autumn of 1774, and his widow, with scanty means, took up the task of rearing their five children, for a daughter, Mary, and a second son, Abraham Smith Fulton, had been born since 1765.



ROBERT FULTON'S BIRTHPLACE, LITTLE BRITAIN, PENNSYLVANIA.

Robert Fulton, the older son, was then nine years old, a bright, active boy, eager for all sorts of fun. An uncle, his father's brother, took him to his home for a time, but Robert was unhappy away from his mother and returned to her. He early learned to carve his fortune from the hard rock of adversity.

CHAPTER II

ROBERT FULTON'S BOYHOOD

So many anecdotes have been told about Robert Fulton's boyhood that they will fill a whole chapter. It is an inspiration to boys and girls, who dream of fame through splendid future action, to realize that a hero usually begins life by a normal childhood, striving to do well the trivial tasks. Daily duties well done form character, and only character creates worth.

Robert Fulton studied at home, under his parents' teaching, until he was eight years old. By this time the family had returned to Lancaster, and Robert was considered old enough to attend the school kept by one Caleb Johnson, a Quaker.

He had learned to read and write and was eager for school. We can fancy the scene of his entrance to the class-room, his dark eyes bright with excitement, his curls brushed to parted order, as he encountered for the first time the austere school-master, an impressive personage in that day. He was guarded on either side by his fond elder sisters,

Peggy and Belle, but their care could not protect him later from the tutoring birch, when Caleb Johnson discovered, as he thought, that Robert was "a dull boy." The younger sister, Mary, — or Polly, as she was called, — and the baby brother, Abraham, were at home eager to hear Robert's description of school life.

But after all, Robert seems not to have cared very greatly for his books. His delight lay in visiting the machine-shops of the town, where he spent all his spare time in trying to make things he needed or wanted. One day he explained his late arrival at school by saying that he had been at Nicholas Miller's shop making a lead-pencil — "the best I ever had," he declared. He had pounded out the lead and fitted it so neatly into a wooden case that Caleb Johnson admitted it was indeed an excellent pencil. Within a few days, — so eager are children to follow a leader, — all the boys had made for themselves, with more or less success, pencils like Robert's.

Sometimes his plans for making things so filled his thoughts that he dreamed over his books and was unprepared for recitation; then Caleb Johnson, after the stern fashion of those days, called him to the desk and bade him hold forth his hand for a whipping by the ferule. Once, when the teacher

thought him particularly idle, he struck Robert sharply over the knuckles, saying, "There, that will make you do something!" The boy, roused by a sense of injustice, replied with politeness yet with reproof :

"Sir, I came here to have something beaten into my brains, and not into my knuckles." With head held high and arms folded, he walked back to his place, seeming even to Caleb Johnson, at the time, "a strange boy." When Robert's mother called at the school to talk over her son's progress — for she was worried at his giving so little attention to his books — the master replied,

"Robert says his head is so full of original ideas that there is no room in his brain to store away the contents of dusty books."

He was beginning to consider life's problems and he dared to try to solve them by ways of his own. He was never really idle, for two absorbing interests claimed attention, — the study of machinery and the study of art.

For it was not very long before that lead-pencil, pounded with such care at Nicholas Miller's store, began to reveal Robert's talent for drawing. He sketched parts of machinery in the various shops of the village and made himself so useful to the mechanics that they welcomed his visits. Then,

as Robert realized the beauties in nature, his black pencil seemed to disappoint him. He could find no paints or crayons at the shops, and it was not until a playfellow brought a box of paints to school that Robert realized the possibility of such an aid to making pictures. He pleaded with his friend for a share that he might try his hand at mixing colors, so it was agreed that each boy should paint a picture on a mussel shell. The result proved Robert so excellent an artist that his generous schoolmate, whose talents lay in another direction, presented Robert with the entire outfit. His delight knew no bounds, and thereafter he never was at a loss for occupation.

Like many another famous man, it should be noted that Fulton did not enjoy the advantages of a liberal education in his youth. Beginning work at an early age, by the need of earning his living, he necessarily left his desk and books before he had mastered the higher branches of knowledge demanded by his later work. Still, he was determined to acquire knowledge. Busy by day, he studied by night, and in time added higher mathematics, languages, chemistry and perspective drawing to his mental stores. In fact, Fulton was a student throughout his entire life.

To-day his spelling seems to us distinctly original

and often amusing; but let us remember that he lived in "the good old days" when that particular art was largely a matter of inspiration, instead of being governed, as it is to-day, by stern and unbreakable rules.

The War of the Revolution was in progress during the days of Fulton's boyhood, and the town of Lancaster was the scene of many important acts.

There had been many English settlers in Lancaster, so it is not surprising that the town abounded in "Royalists," — sympathizers with the British Crown.

The time and place were rife with excitement. Village boys shared the news, one with another, and followed every skirmish with active interest.

In 1775, Major John André, with other British officers on their way to Quebec, was captured by General Montgomery and taken for safety to Lancaster. So crowded were the barracks that André, on his word as a gentleman, was allowed the following parole :

"I, John André, being a prisoner in the United Colonies of America, do, upon the honor of a gentleman, promise that I will not go into or near any seaport town, nor further than six miles from Lancaster, without leave of the Continental Congress or the Committee of Safety of Pennsyl-

vania, and that I will carry on no political correspondence whatever on the subject of the dispute between Great Britain and the Colonies, so long as I remain a prisoner."

A man named Caleb Cope received John André into his home and André tutored his son, John Cope, thirteen years old, and gave him lessons in art; for André had a decided talent for the brush and loved to depict, from recollection, the scenes of his English home. One of these pictures, a landscape with a church and lodge among a bower of trees, André gave to Mr. Cope who treasured it in later years. He described André as "a gifted and deceived, but noble-hearted and generous, man." It is thought that John Cope was the boy who presented the painting outfit to Robert Fulton, so it is probable that, indirectly, Robert may have profited from Major André's instruction.

Because of its political importance Lancaster was the local headquarters for supplies necessary to American troops, and rifles, blankets and clothing were manufactured there. American soldiers patrolled the streets and had in charge the two thousand British prisoners at one time garrisoned there.

The boys of Lancaster, in the late afternoons, gathered to view the novel scenes of the encampment. After a time, growing braver, they chal-

lenged "the rebels," as they termed the Hessian boys, with the consequence that boyish battles began to take place between the "Tories" and the "Rebels." A rope, stretched across the street, defined a limit which none dared to pass.

Robert Fulton's imagination was lively and carried him beyond bounds. One day he made a graphic sketch of the scene, depicting the "Rebels" advancing beyond the line to threaten a thrashing to the "Tories." He showed the picture to the boys and it had the unfortunate result of inspiring them to the very action portrayed. The town authorities, hearing of the skirmish, feared that the boys were carrying their fun too far and put a hasty stop to these martial games.

Through these stirring days Robert Fulton was daily learning the excellent lessons of self-reliance and self-support. He learned, as we all should, in school and out of school. The Continental authorities employed certain firms to manufacture and repair arms. Guards at the doorways of factories forbade any interruption of the important work, which was pushed with speed, and none but employees might enter. Workmen labored in relays, night and day; even on Sunday the sound of the hammer and engine could be heard.

Special permit was granted to young Robert

Fulton to go within the shops, for by this time he was so good a draughtsman that his pencil could occasionally outline a suggestion of value, and his increasing knowledge of mechanics made him an apt pupil in the study of the tools of warfare. At this time he commenced to draw designs for fire-arms and as early as 1779 made himself an air-gun.

A certain druggist sold Robert several packages of quicksilver, and these formed part of some mysterious experiments which Robert declined to describe to his curious friends. The workmen in the gun-shop tried in vain to compel him to explain the use to which he put the silvery, elusive metal. So puzzled were they by his secret that they called him in fun "Quicksilver Bob," and by this name he was known for some time among the workmen of the shops and among his young comrades.

Robert accompanied the gunsmiths upon their testing tours of marksmanship on the open common, or village park; he soon learned to prove calculations of comparative carrying distances of varying sized bore and balls, by shooting at a mark and finding the relative distances and forces of carrying powers.

Among the factory clerks was an intelligent youth, Christopher Gumpf, four years older than

Robert, who in 1779 became his intimate friend. The father was an enthusiastic fisherman and accompanied the boys upon many a fine excursion in his flatboat on Conestoga Creek. When it was not in use he padlocked his boat to a tree, but when off on holiday trips he would ask the boys to pole the boat to certain shady fishing-grounds.

Robert became weary of the hard work of poling the heavy boat for long distances. During a visit of a week at his aunt's home in Little Britain, he planned and made a small model of a boat to be propelled by side paddles. It was too large to carry home, so Robert placed the model in his aunt's attic and asked her to keep it for him. Many years after, when Robert's first steamboat had become famous, that model was brought down from the attic and proudly placed in the aunt's parlor as the most valued treasure of the house.

When he returned to Lancaster Fulton told Christopher Gumpf about his plan, and together they made a set of paddles, propelled by a double crank action, to move the fishing-boat. Two lengths of timber, with a blade at each end, were fastened at right angles to the boat: a crank at the stern turned the blades, while a third paddle, as a rudder, revolved on a pivot to steer the course. The invention worked well and the delighted boys

abandoned the work of poling. The paddles were removable from the boat, and, when not in use, were hidden in thick bushes near the water.

So it was on the Conestoga Creek, with only two witnesses who little dreamed what the contrivance would lead to, that Robert Fulton, the fourteen-year-old boy, began to plan a solution to the problem of navigation.

CHAPTER III

PAINTING PORTRAITS AND MINIATURES

THERE comes in every boy's life a day of great decision; it is when school days are over, and the boy, face to face with the toiling world, decides by which branch of industry he shall perform his share of the world's work to earn his living. Such a day came to Robert Fulton and he had prepared himself for it.

His mother's early lessons, the sterner teaching of Caleb Johnson, the visits to the machine-shops, the constant sketching with pencil and crayon, — all had enriched his mind for this day of the choice of vocation. As he felt the call to a larger field of action than Lancaster afforded, it was natural that in seeking his fortune he should turn to the nearest big city, Philadelphia, noted as a center for the peaceful arts of the gentle Quaker folk, its founders.

Robert Fulton was seventeen years old when he left Lancaster to take up his abode in Philadelphia. With war at an end, the country had entered upon the enjoyment of the welcome fruits of peace.

As we study the few facts known about Fulton during this period, it is easy to discover several important reasons which influenced him toward art as a career, and Philadelphia as a place of residence.

Benjamin West, a native of Chester County, Pennsylvania, was at this time famous as a painter in London; he was a man whose success had brought special pride to Lancaster, for he had there begun his career as portrait painter. West's father, an intimate friend of Robert Fulton's father, allowed his son, at the early age of twelve, to visit Lancaster in order to paint the portraits of a certain Mrs. Ross and her children. He had been so successful that orders poured in, taxing his time and strength to fill them. Canvas could not be had, so he painted his pictures upon smooth boards. His genius had been shown when he was very young, for at the age of seven he sketched a correct likeness of his sister's child in the cradle. He had no colors to work with until a party of friendly Indians visited his home, and Benjamin, in boyish pride, showed them his pencil sketches. They generously gave him the colors they used to paint their faces and ornaments, hues extracted from the juices of berries and herbs. They also taught him to mix the paints to form new shades and combina-

tions. He had no brush, so he made one by taking from the tail of a cat some furry hairs which he pulled up through a goose-quill. We remember the adage, "A poor workman blames his tools." A good workman can manage to make tools from almost nothing, if he really wants to work.

The fame of Benjamin West in London was a favorite topic of conversation in Lancaster. Robert Fulton had already been able to sell mechanical drawings to the shops and had painted tavern-signs, as had West, for local inns. What more natural than that Fulton, with like talent for art, should decide to adopt portrait-painting as his profession?

Mrs. Fulton's heart must have been very full as she bade her eldest son goodby and saw him mount the stage-coach for the journey to Philadelphia. He had some friends in the city, Lancaster people who had gone there for business or other reasons, for a large city always drains the adjacent villages of the enterprising folk who desire greater fields for action.

Robert Fulton had a cheerful and happy nature and a real talent for making friends, so he soon added new acquaintances to his list, though he was always particular to choose his companions wisely.

It was a brave venture for a country lad of seven-

teen to attempt self-support by art in a great city, but he was eager to acquire every kind of knowledge, and applied himself earnestly to whatsoever his hand could find to do. He designed carriages and buildings; he made mechanical drawings for machine-shops; he copied sketches in India ink; he painted tavern-signs, and all the while, he studied the finer art of portrait and miniature painting, with the hope of making this alone his profession when time should grant him sufficient skill.

An interesting example of Fulton's early art is a sketch in India ink of a French landscape, showing peasant women washing linen by the side of a stream. It is entitled "La Blanchiseuse" and signed "Robert Fulton, March 15, 1783," so it was made during his first year in Philadelphia. Probably it was a copy of a French engraving in the Museum where Fulton took lessons when he could afford to employ a teacher.

At that time Charles Wilson Peale was the foremost artist in Philadelphia, and it is thought that Fulton availed himself of his instruction, — at any rate they were friends during later life.

In 1785 the young Lancaster student was registered in the city directory, "Robert Fulton, Miniature Painter, Cor. of 2d & Walnut Streets," which indicates that he was launched in his pro-

fession. The following year he painted a portrait of his "Good Friend, Joseph Brighthurst," a Quaker patron. This portrait is labeled "Second portrait in oils," which defines the time when Fulton began to paint large portraits, although prior to this date he had made many crayon portraits and miniatures.

At that time Benjamin Franklin, about to go to France as American Ambassador, was the chief personage of Philadelphia. It was a fine feather in Fulton's cap when the great man showed him favor. Franklin admired Fulton's painstaking work and pleasant manner; it is said that he showed him unusual attention and introduced him to prominent men of the city. From this time Fulton's services as a portrait painter were steadily engaged and orders flowed in. In 1787 Benjamin Franklin himself sat for his portrait, and this, of course, greatly helped to set the fashion. Its astonishing adventures are thus described in the *Pennsylvania Magazine of History and Biography*:

A portrait of Ben. Franklin painted by Robert Fulton of steamboat celebrity. On the back of the canvas is written "R. Fulton, Pinxt, 1787." The history of this rare picture is distinctly traceable back thirty-three or thirty-four years, at which time it was sold at auction for twenty-five cents. For thirty years it hung without frame in the sitting room of a Rhode Island farmer. At another time

it was used as a barrel cover in a farmer's garret, and still later ornamented an engine house. The Rev. Henry Baylies found it in a photograph gallery in Fall River, Massachusetts. Mr. Baylies sold it in 1891 to C. F. Gunther, of Chicago.

Among the prominent citizens to whom Franklin introduced young Robert Fulton was John Ross, a successful merchant, who in friendly interest suggested that the artist should make a specialty of crayon likenesses of the young ladies in society. To set the fashion, Mr. Ross ordered portraits of his two daughters, Margaret and Clementina.

Mr. Ross was devoted to Clementina and when summoned to Paris on business for the government, wished her to accompany him; but Mrs. Ross, knowing that the ocean was infested by pirates, feared that their daughter might fall into their hands and raised so strong an objection that Clementina stayed at home. So Mr. Ross had her crayon portrait copied on ivory and carried the miniature as traveling companion.

Fulton's portrait shows Margaret Ross in fancy dress, with tall jeweled head-gear, holding in her hand a full-blown rose.

Perhaps the daintiest bit of work ever accomplished by Fulton was an exquisite miniature of a certain Mary West, so tiny that it is set, as a jewel,

in a finger ring. The likeness, oval in shape, is surrounded by brilliants. According to family tradition, Fulton painted the ring that Mary West's brother might wear it at the Court of St. James in London. Her father, William West, came to live in Philadelphia about 1750 and was probably related to Benjamin West, the artist.

It is easy to see that, by reason of hard work, Fulton was already on the highway to success. He persevered at his profession and gained not merely money but also the esteem and confidence of his friends. Unfortunately, constant labor began to tell upon his health and, when he was twenty years old, a heavy cold fastened so severely upon him that he fell ill with inflammation of the lungs, followed by symptoms of the dread disease, consumption.

He consulted an eminent doctor, by whose advice he immediately left the city, with a proposed ocean voyage in view for the benefit of his health. He journeyed first by stage-coach to the famous Hot Springs of Virginia, where it is said some of his father's relatives had taken up land. This change did him great good. He not only gained strength but made many new friends. Their advice deepened his desire to go to Europe to view the art treasures of the old world, and, with the doctor's

prescription of an ocean voyage in mind, he began to plan to cross the Atlantic.

During his stay in Philadelphia, nearly four years, he had grown from a country lad, eager to earn his livelihood, into a young man of ability, whose friendship with intelligent men, coupled with his unremitting study, had given him mental poise and an easy manner of deportment. No longer was he awkward and shy, but ready to mingle with men and women of culture and feel himself, as indeed he was, one of them. He had, moreover, proved the fact that he could earn his living by art, for he had saved a substantial "nest-egg," as the result of his industry. With the happy optimism of youth he looked on the bright side of life and was eager to see the old world across the seas. It was a wise decision. His mind was open to receive impressions and keen to recognize universal needs, which he could later help science to provide.

One anxiety alone clouded the prospect; not his ill health,—for already he felt stronger and was assured that he was on the way to complete recovery,—but tender thought for his widowed mother. Up to this time he had been able, from time to time, to send her gifts of money; now he took counsel with his friends as to how he might best provide for her future comfort.

A family who owns its home is free from the monthly bill of rental to a landlord. A "roof over the head" is of prime importance to ease of mind. Possibly Fulton's remittances of money had been devoted to house rent ; be that as it may, he decided before he set sail for England to provide his mother with a home of her own. She was fond of a garden, and flowers were her delight ; so he decided that a small farm, where food could be produced for the family of growing girls and the younger brother, would prove to be the best and wisest gift he could bestow. Our next chapter will tell of the pleasant farm on which Fulton established his mother and family before he set sail for the old world.

CHAPTER IV

THE GIFT OF A FARM

DID you ever hold a camera film to the light? All things are turned about; the right side becomes the left, and the first object in view appears to be the last, at the extreme end of the picture. So it seems when we take a mental review of the past, — the point of contact is reversed and we can balance accurately the lights and shadows that appear.

To the mind of Robert Fulton, about to make a venture which called for courage, — a voyage to an unknown land, — the chief aim of his life was the care of his mother, whom he must leave behind. The longer he thought, the more was he convinced that better than a sum of money, which might be lost or stolen, would be the gift of a farm-home where she could settle down to enjoy an old age of security and peace.

We can well imagine that he cast about in his mind properly to determine the best location for this purchase. It appears that a relative, the Rev. Joseph Smith, had been called to the pastorate

of the Presbyterian Church in the town of Hopewell, Washington County, Pennsylvania. In order that his mother might have the care and protection of this relative, Robert Fulton decided to buy the new home in Hopewell. He selected a farm of more than eighty acres on Cross Creek, a fertile spot near running water, not unlike the farm which had been his mother's earlier home and his own birthplace.

The long journey through the wilderness which lay between the two settlements had to be made by coach or wagon. It was like a fresh start in life to Mrs. Fulton and her family, three growing daughters and the young lad, Abraham, now about sixteen years of age. The "big brother," Robert, was looked upon with great admiration; his success in Philadelphia, his friendship with the famous Franklin and other prominent men of the country, and his tangible gift of the new home — all proofs of his industry — must have filled the mother's heart with gratitude and pardonable pride, as she looked, with mingled joy and anxiety, at her tall son battling with ill health yet resolved to conquer that and every other obstacle to success. He must indeed have been a son and brother to be proud of!

The new home was in Hopewell Township, one mile northeast of the present little village of Buffalo

near Pittsburgh. It was sold to "Robert Fulton, miniature painter of Philadelphia," for about \$400.00 — not a large amount for a home, to be sure, but it was quite a sum in those days. We know the land had been cleared, cultivated, and planted, a great help toward its establishment as a productive farm. Upon it was a two-story peaked-roof dwelling having a central hallway and a kitchen extension. Chimneys at both ends provided generous hearths for winter comfort and a tall spreading tree in front gave grateful shade through summer heat. In an old colored print of the scene several cows are shown in the pasture near the creek and an adjacent log cabin was probably used as a cattle barn.

It has been stated that Robert Fulton gave the farm to his mother on his twenty-first birthday, a generous way to prove that "it is more blessed to give than to receive." Most of us are looking for gifts on similar happy occasions; it is another and a better way to celebrate them by a gift to the mother who gave us birth. The deed is dated May 6th, and Robert's birthday did not occur until November 14th, but the actual taking possession of the home may have been deferred until the latter date.

During the month of September of the same year,

Robert Fulton also purchased for seventy-five dollars four lots in the town of Washington, Pennsylvania, which, through the enterprise of its pioneer settler, John Hoge, had just been surveyed and mapped into streets. Washington seemed a promising field for investment and Mr. Hoge a man of integrity and good judgment. Fulton had great confidence in him, and while in England sent letters and remittances of money for his mother in Mr. Hoge's care.

It appears that Fulton bought these four lots with the thought that they would provide home sites for his sisters and brother when they married. He later conveyed them to the three sisters, and in a letter to his mother, directed that the fourth lot be sold to pay the remainder of his indebtedness to Mr. Pollack for the purchase of the farm.

In 1786 Isabella Fulton married Peyton Cooke. In February of that year he obtained a deed for "a lot of ground and hewed logs for a home." At the end of the document appear these words, "By Peyton Cooke's direction, this deed is made for Robert Fulton." Probably Fulton had advanced money for the transaction.

Some time later, Elizabeth Fulton, or Peggy as she was called in her brother's letters, became the wife of a Mr. Scott, who probably died in a few

years, for his wife and children made their home on the farm with her mother, and its ownership was secured to her by Robert Fulton's will in 1815.

In 1790 Mary Fulton, or "Polly," married David Morris, a nephew of Benjamin West. Mr. Morris was a man of local prominence and his intelligence seems to have rendered him the most companionable of Robert Fulton's brothers-in-law.

Abraham Smith Fulton, the only brother, is said to have opened a school in the town of Washington. During his later life he was employed by his brother in running an early steamboat on the Ohio River. Some time after this, in overseeing the building of a log house, on a bluff not far from Pittsburgh, he was instantly killed by the collapse of the structure.

This, in brief, is the story of the sisters and brother of Robert Fulton. Through eighteen years' absence in Europe his love for them remained true; and when he made his will, in 1814, he left to each a legacy, and relinquished all right to money which he had at different times lent them.

Mr. Morris built the home for his wife, Polly Fulton, upon the lot adjoining Mr. Hoge's home, given her by her brother. A letter, written by Robert Fulton to his mother, from London, June 14th, 1790, alludes to the happy event. It shows

so clearly his unchanging love and generosity that I quote it in full :

DEAR MOTHER ;

I have rec'd yours of January 29th, 1790, and am happy to hear of the good health of the family which is the first consideration and nearest my heart. May Heaven continue to Shed that blessing on you and I shall be happy.

I can easily conceive your garden to be the best in Washington ; Gardening ever was your delight, besides you have a taste for that kind of cultivation which perhaps the people of your Western Country are Strangers to.

Be assured my Ideas often hover around the little spot. I think I see it improved by your Industrious hand whilst the flowers of Spring lend their aid to beautify the scene ; but chief of all I think I see you on a Sunday evening contemplatively walking on the grounds and with Silent pleasure viewing the labours of the week. And thus each evening Reflect with pleasure on the past day. So shall time pass on and pleasure Crown the evening of life. Here I could enter into a Chain of those Ideas which Crowd upon a heart sensible of the feelings of a fond mother and the affection due from a child, but I must be silent and only answer your letter.

It has given me much pleasure that you do not wish me to hurry home till I complete my study. Indeed it is of so much importance my gaining all possible knowledge that should I now return I might have it to repent of ever after. And our hearing so frequently from each other is some reason why we should be more easy in the subject.

You tell me Polly is going to be Mar(r)yed. May she be happy, but I will write to her on the subject. . . .



BUILDING FORMERLY OCCUPIED BY CALEB JOHNSON'S SCHOOL, LANCASTER, PENNSYLVANIA.

As for the pictures for Polly, she should have them with pleasure but I do not paint anything so Small and the carriage of any of my paintings would be very expensive but whenever I conveniently can I will send you my own picture.

I am just getting ready to go to France for 3 months and am afraid I shall not have time to write to Abraham but give my best love to him and all friends and believe me to be with Continued affection,

Your loving son,

ROBERT FULTON.

So Polly wanted some of her brother's pictures to hang in her new home; and the home itself was built upon one of the four lots purchased by her generous brother.

But let us turn in thought to the young Robert Fulton bidding farewell to his mother and family, in that autumn of 1786. It is probable that he sailed from New York, for in a later letter he mentions friends in that city and also in Baltimore, where he had stopped on his way to Virginia.

He was not empty-handed; he carried forty guineas in his purse and one letter of introduction which was worth more than money, for it was from the great Benjamin Franklin to the American artist, Benjamin West, then at the height of his fame in London and soon to become president of the Royal Academy.

The vessel spread its white sails and turned forth upon the ocean for the long voyage to England; and one brave passenger, the Pennsylvania boy, Robert Fulton, set his face forward with eager hope toward a new world.

CHAPTER V

STUDYING ART IN ENGLAND

A VOYAGE to England in a sailing ship took time ; probably six weeks at least elapsed before Robert Fulton could discern the long gray coast line of "Mother England." If anxious about the new venture, or lonely for the family he had left behind, he pushed aside all gloomy thoughts and made ready to meet the new conditions of a strange land.

He journeyed directly to London to present to Benjamin West the important letter of introduction which he carried from Dr. Franklin. The strong sea air and the long rest on shipboard had benefited his health, and he was thirsting to get to work as soon as possible.

His ease of manner and self-confidence had sufficed for the experiences of Philadelphia, yet it is reasonable to assume that his heart beat fast when he finally stood, letter in hand, at the imposing doorway of Benjamin West's fine house, for it surpassed his expectation of grandeur. To his eyes it appeared a palace ! The main house was

connected by a long art gallery with the studio, a lofty suite of rooms, filled with sketches and designs for historical paintings; for West had specialized in this form of art and had already been favored by royal recognition. Approval by the king was the highest honor England could bestow, and in time West was elected president of the Royal Academy. If young Fulton had profited by his personal intercourse with Dr. Franklin and other men of genius in America, we may readily believe that he gained even greater mental stimulus from West, who, like himself, was a Pennsylvania farm-bred boy.

West and his wife gave the young American a hearty welcome and an invitation to stay in their home until he found suitable lodgings. He gladly accepted their kind hospitality and a strong bond of friendship was formed between the two men which endured throughout their lives. One of the finest portraits we have of Robert Fulton was painted by Benjamin West.

It is said of West that his work was never a burden to him but always a joy. He sat at his easel as though in sport, not in labor, and painted more than a hundred portraits, in addition to large canvases depicting historical scenes. In studying the life of any and every great man, his industry becomes our wonder. The same number

of hours — twenty-four — are allotted to us all, yet how sadly different are the results accomplished, how differing the totals! Hard and well directed work is always the secret of success.

It was not long before Robert Fulton's easel was set up in West's studio, and, under the tuition of the older man, the student was working with infinite pains. West must have seemed to Fulton like a king among men, and he endeavored to gain all possible profit from the master's lessons.

His dear mother, on the Pennsylvania farm, must have been greatly cheered when she received letters from over the sea. She treasured the following, written by Fulton's friend George Sander-son, of Baltimore. Yellow with age, it is still carefully preserved. It begins with old-time formality.

BALTIMORE, 25th July, 1788.

MADAM ;

I am happy in informing you that I arrived here a few days since from London where I had the pleasure of meeting with your son, Robert Fulton. He was when I left him in perfect health & what will I believe be pleasing information to you, that his improvement in the liberal art of painting is almost incredible. Add to this his personal accomplishments & prudent behavior has gained him many friends & those who have ability & inclination to befriend him.

Mr. West, a Gentleman who is the King's Historical

Painter & a Man of independent Circumstances I am happy to inform you is number'd among his Friends & has in consequence of your Son's ingratiating address & manners, patronized him.

He further speaks of "Bob's regret that his friends have not dropped him a line since he arrived in England," and offers to forward any letters that may come enclosed to his care in Baltimore. The letter, with its quaint phrases, gave good reason for joy in the quiet farm-house by Cross Creek.

Although Fulton stayed for a time with Mr. and Mrs. West in their delightful home, the burden of self-support was before him. He soon found lodgings in the vicinity, but a "guinea a week" was too great a price for his slender purse and he made another change; in fact, he made several during the succeeding years, "to suit his convenience" as he terms it in a letter to his mother, but he always arranged to reside near Mr. West.

You will notice that George Sanderson spoke of "Bob's personal accomplishments and *prudent behavior*." It is well to make a special mental note of this latter fact, for many a temptation comes to a youth in a strange land, yet there never echoes a whisper of reproach against Fulton's conduct.

This "prudent behavior" was a safeguard to his character; he was merry-hearted and had many friends but all of the right kind.

On April 14th, 1789, Fulton wrote his mother that he was in perfect health and had good prospect of succeeding in his profession. He confessed that "painting requires more study than I at first imagined, in Consequence of which I will be obliged to stay longer than I expected. But," he adds, "all things work together for good and I am convinced my exertions will have a good tendency." There is brave hope in the letter but a touch of home-sickness: "In your next letter," he continues, "please to give me a very particular account of everything you know, particularly how you like the little farm, — if you have a good garden, and what kind of neighbors you have got. And in fact I should like to know everything that will give you pleasure or promote the happiness of the family. There is nothing interrupts my happiness here but the desire of seeing my relations, but time will bring us together and I hope at my return to see you all happy as the day is long."

It is a very human letter, just such as any fond son might write from a strange land. The constancy of affection, the admission of loneliness, the confession that his task is hard and long, yet withal,

the brave faith in the Bible promise taught by his good mother that "all things work together for good," is stronger than any note of weakness.

It was not long before Fulton's winning manner gained him a host of friends in London, for in West's studio he met many prominent men, and they in turn introduced him to others. With one of these, Mr. Henry Fulton, a distant kinsman, he became intimate and arranged that all his letters should be sent in this gentleman's care, for he was a London merchant and well known. Mails were very irregular in those days, and it was uncertain whether a letter, even when properly started, would reach its destination. Postage rates were high and kindly friends who were crossing the ocean carried packets of letters which they passed on to other travelers, until the missives finally reached the persons for whom they were intended.

At this point we may let Fulton tell his own story, for none could tell it so well. The letters which follow are intimate; they confide the secrets he withheld from those about him and confided to his mother only when times brightened and his success as an artist became certain.

Although happy in forming new friendships in a new land, Fulton could not forget the comrades of his early days. The fifty letters he so casually

alludes to in the following letter probably represent but a few of the many friends whom he cherished in memory and desired to touch with that far-reaching wand, the pen of remembrance.

The letter to his mother was written from London on July 31st, 1789.

AFFECTIONATE MOTHER;

With pleasure I imbrace every opportunity to write you and these letters will be carryed to Phila. by Mr. Benjamin Barton; but as I wrote you some time ago in answer to letters which I Rec'd from you and Polly, to which Letters I have as yet had no answer, this must be a short one In which I must only give you some account of private affairs. My health is perfect: this Climate agrees well with me; my Prospect is good and In Short I am very happy as I have many Respectable Friends. But the Emence desire to see you, together with the rest of my Family gives me many anxious hours And but for this I could sit myself down with Content in England. But I love my Country and Friends And no Consideration shall separate me from them — this is my present Resolution. But why do I make this promise?

Alas I am possessed of no more fortitude than other Men, and some unforeseen Stroke may separate us for ever; but hope is ever by my side and I hope ere long to have the pleasure of seeing all of you. . . .

As I am frequently changing my Lodgings to Suit my Convenience I Shall now give you new directions for your letters. It is to a permanent Merchant's house, a namesake and Intimate friend of mine, and the letters will be much

more likely to find him than me in which case I shall allways get them. You must direct them exactly thus

Mr. Robert Fulton,
Painter,
To the care of Mr. Henry Fulton,
No. 9 Watling Street,
London.

I beg you'l pay particular attention and have them precisely in the above manner and if they come to London I am sure to get them. . . .

You must excuse the shortness of this letter as I am under the necessity of writing to my Phila., Virginia, New York, Lancaster and Baltimorien friends, which in the whole makes 50 letters of much the same length as this. Therefore to conclude this I shall (torn place in paper) be very particular and let me know every thing that you possibly can when you write — to write small and close that you may say a great deal in small compass for the ships often put the letters ashore at the first port they make, they come post to London And I have often paid half a guinea for a small package of letters. The better to accomplish this you better buy letter paper as it is thin for we pay according to the weight and not the size so if you can send me a pound of news upon an ounce of paper I shall save allmost a guinea by it.

I have just left myself room to wish all of you every happiness and love and Compliments to Mr. Smith, Polly, Abraham, Bell Peyton and all Friends And believe me to be everything that is dutifull and affectionate in a Son, Brother and Friend,

R. FULTON.

He adds in postscript :

I was happy to hear by your last letter directed to Mr. West that you were down in the Country among our old friends and that they together with my good old Grandmother were in good health.

This letter fairly depicts Fulton's hopes, longings, and accomplishments during his student days in London. They were days of anxiety and of hard work ; for hours he would ponder over the "ways and means" of life, and had it not been for the friendship of kindly acquaintances he might have yielded to despair, or have been tempted to set aside the chosen career. In poetic terms he speaks of "Poverties' cold wind and freezing rain"; and it is evident that he suffered, as far as his happy nature could permit, the pangs of loneliness and of almost actual hunger. Yet he pressed on with his work, and in time the magical wand of industry wrought a welcome change.

So passed the first four years of his stay in England, years of fresh impressions, strict economy and untiring labor. Added to his anxieties were the entreaties of his mother to return home, for he writes, November 21st, 1790, "You must not be uneasy at my not returning home as soon as I first intended for it is of the utmost importance my

continuing to prosecute my studies in London, and were I to return I must live in Phila. or New York, which would still be distant from you. Besides the certain method by which we have letters from each other ought to make us easy."

His joy was great when in 1791 he attained the honor and pleasure of admission of two of his canvases to the Royal Academy and four others to the Exhibition of the Royal Society of British Artists; the former were portraits of young gentlemen, the latter more ambitious works similar to West's — a study from the Bible story, "Elisha Raising the Widow's Son," and "Priscilla and Alladine" from Spenser's "Faerie Queen."

It was natural that he should take up the study of English history at this time, and two paintings, "Mary Queen of Scots" and "Lady Jane Gray" are interesting and beautiful examples of his art. Both were painted in 1793. No doubt West encouraged and instructed him in this sort of work, and Fulton dreamed of a brilliant future like that of his teacher.

We are grateful for the light which the letters already quoted cast upon the years Fulton spent in England, for, until their discovery, this period was obscure. After he had attained fame, his letters and drawings were treasured, but as a

humble student in a strange land, it was difficult to follow his routine of life. At the close of a hundred years, when the city of New York celebrated the discovery of the Hudson River and Fulton's successful steam navigation upon it, descendants of Fulton's sisters lent to the New York Historical Society for exhibition, these interesting documents which throw some light on the early years of the inventor's life. They had been treasured by his dear old mother on that distant Pennsylvania farm, and handed down through several generations to the present owners.

CHAPTER VI

FROM ART TO INVENTION

IF you had been working very hard, and suddenly received an order from an influential man to do a responsible piece of work for him, you would be very happy over it. Such a pleasure came to Robert Fulton in 1791, when Lord Courtenay, the Earl of Devon, invited the young artist to visit his famous country estate, Powderham Castle, during the vacation month of June, to paint his lordship's portrait.

The castle in Devonshire, which is one of England's most beautiful counties, was about two hundred miles from London. There the Earl lived in princely grandeur, and admitted to his court only persons of equal rank; all others were entertained by his steward, a gentleman of birth and education.

This visit proved a turning-point in Fulton's life. With high hope he made the journey by stage-coach, reveling in the springtime glory of the wooded country-side. The study of the art treas-

ures in the castle, and his appreciation of them, led to a later tour of other famous country-estates in England, and he became familiar with the great masterpieces of painting which hung in the spacious private galleries of the nobility, for Lord Courtenay, pleased with Fulton's fulfilment of the intrusted commission, introduced him to all his friends.

It was a novel and valuable experience for the young man. Devonshire is noted for its scenic beauty and healthful climate: so the trip not only gave the hard-worked student a beneficial change of air and scene, but also put money in his purse, and quieted the fears of possible failure which had occasionally disturbed his peace of mind.

Once again Fulton himself shall tell us, through this quaint and delightful letter to his mother, of the pleasant change which had befallen him:

DEVONSHIRE, Jan'ry 20th, 1792.

MY DEAR MOTHER,

This morning I rec'd a package of letters from Philadelphia among which were one from you, one from Abraham and two from Mr. Morris, one of which was for Mr. West. In Consequence of my leaving London on June last for to do some business for Lord Courtney In Devonshire which is about 200 miles from London The letters by some accident have not reached me till now. As you rely on it I should have answered them by the first Conveyance — But I Rec'd them with Infinite pleasure as they come from you

and Informed me of your good health. And now I will attend to the particulars As I am well convinced every Incident Relative to my life will Communicate pleasure to you. You express much desire to know how my pictures were Rec'd at the Royal Academy — this I believe I answered before but possibly the letter has miscarried You will be pleased to hear that I sent eight pictures which Rec'd every possible mark of Approbation that the Society could give, but these exertions are all for honor — there is no prophet (profit) arising from it. It only tends to Create a name that may hereafter produce business.

My little tour through France proved very agreeable and was of some service to me as a painter in as much as I saw the works of some of the most able masters in the art, which much improved my eye and taste.

Mr. West and me are on a very familiar footing and when he is in town pays me much attention which is extremely agreeable as we live near each other.

. . . And I must now Give Some little history of my life since I came to London. I brought not more than 40 Guineas to England and was set down in a strange Country without a friend and only one letter of Introduction to Mr. West — here I had an art to learn by which I was to earn my bread but little to support whilst I was doing it. And numbers of Eminent Men of the same profession which I must Excell before I Could hope to live. Many, many a Silent solitary hour have I spent in the most unnerved Studdy Anxiously pondering how to make funds to support me till the fruits of my labours should be sufficient to pay them. Thus I went on for near four years — happily beloved by all who knew me or I had long ere now been Crushed by Proverties Cold wind — and Freezing Rain —

till last summer I was Invited by Lord Courtney down to his Country seat to paint a picture of him which gave his Lordship so much pleasure that he has introduced me to all his Friends. And it is but just now that I am beginning to get a little money and pay some debt which I was obliged to Contract so I hope in about 6 months to be clear with the world or in other words, out of debt, and then start fair to Make all I Can.

You see dear Mother this is very different from being Rich(?) not that I can say I ever was in absolute want. Heaven has been kind to me and I am thankfull — hoping now to go on Smooth and happy as the absence from my friends will admit of — I am happy to hear that all my relations are well. I shall write to them separately. I enjoy excellent health which I hope will Continue till I may have the happiness of seeing you. Please to remember me kindly to Mr. Smith and all friends And may Heaven Continue its blessings towards you is the most unfeigned wish of your Obedient Son,

ROBERT FULTON.

You will notice that Fulton says that Lord Courtenay had introduced him to all his friends. Among them were two men of rank and high intelligence, the Duke of Bridgewater and Earl Stanhope, whose influence at this time seems partly responsible for a sudden change in Fulton's line of thought.

The Duke of Bridgewater owned vast coal mines. He sold their product in the growing town of Manchester where coal was in demand for the many

factories; but every load had to be carried upon the backs of pack horses and the transportation was slow and difficult. The duke had been trying to find an easier way and, by the advice of a clever workman, he had opened a canal through his land, and shipped the coal on barges. This plan worked well and wealth began to pour into the duke's coffers. This led to his desire to dig canals throughout England so that produce from farms might easily be sold. The idea was not new, for such waterways had already been used in Europe and in Asia; but the duke's way of building them was somewhat novel, and one of the great difficulties he encountered was that of overcoming the many different water levels.

When we recall the old-time methods, — stage-coaches lumbering their slow way along post-roads; sailing vessels tacking their roundabout paths across the oceans; and harvests wilting on the ground because farmers had no way to send them to the cities where the hungry would gladly have bought them; — when we remember all this we can quickly realize why the thoughtful men of the world were beginning to try to plan new and better ways of transportation.

Robert Fulton could look back in thought to his boyhood days in Lancaster, and recall the story of

the enrichment of certain farmlands by a clever Swiss settler, who had watered a whole range of hitherto barren land, by simply cutting trenches along the side of a hill, wherein water was conducted, from upper springs, to the thirsty lands below. The digging of channels to form watercourses was not new ; it had proved its value.

Inspired by the need of the Duke of Bridgewater, and impressed by the money earned by his simple device, Robert Fulton set himself to study out a better way to build canals.

In fact, about this time he appears to have been pondering on many practical methods to simplify work. He visited the stone and marble quarries in Devonshire and found that the digging and raising of the heavy products was extremely hard work. His first invention was a mill for sawing marble and stone, which proved so successful that when Fulton returned to London in the autumn he sent his model to the Society of Arts, Commerce and Manufactures and received a silver medal and the thanks of the society.

Two talents were now striving for expression in Fulton's active mind, art and science. One or the other had to have his full devotion ; and about this time he seems to have laid aside his brushes, with all their charm and the rewards which he was just

beginning to realize, and to have deliberately taken up the practical problems of invention.

This change was not because he did not love art, for throughout the remainder of his life he continued, from time to time, to paint portraits; he was ever a devoted patron and friend of art, but there was not time for both professions, and that of the inventor now made the stronger appeal.

The everyday needs were those which won Fulton's earliest attention. He made a machine for spinning flax, perhaps in thought of his patient mother at home, working at her old-time spinning-wheel; and he next produced a machine for making rope. It stood in a room forty feet square and could be worked by one man, twisting cordage of any size and winding rope yarn on spools.

In these inventions Fulton saw an opportunity to help mankind to better and easier methods of work, and also a way of securing a competence. His vision was wide; humanity was one family, and the round world provided a vast field for labor. It is not probable that he could have gained this view of life if he had tarried in quiet Lancaster.

He stayed in Devonshire nearly two years, although he returned to London for occasional visits. From Devonshire he went to Birmingham, a town of industrial importance, where he studied



THE WASHWOMAN.

The earliest known drawing by Robert Fulton. Owned by the Estate of Joseph Bringhurst.

the method of the Duke of Bridgewater for building canals from that point to the seaports of England. From that time on his mind was concerned with plans for better means of transport. The years 1792 to 1796 were filled with new activities, new plans, new friends, new places of residence. He visited France, he toured Devonshire, he went to Birmingham and Manchester, the most important manufacturing centers in England where machinery of the highest type then known was in use.

By 1794 Fulton had invented an inclined plane for use in canals, by means of which boats could be lifted by upright hoists or rails to different levels of water; his hope was to avoid the complicated system of locks. He patented it in London, and described himself "Robert Fulton, late of the City of Exeter, but now of the City of London, Gentleman," which indicates that he had laid aside his former titles, "miniature painter," and "painter."

During his stay in Manchester Fulton met young Robert Owen, the manager of Drinkwater's Mill, the first mill to use steam power. Owen was a fellow of fine intelligence and the two young men found many interests in common.

With other well-chosen comrades they formed a club which met on winter evenings to debate all

sorts of subjects, — chemistry, science and religion. They called themselves “philosophers”; and so interesting were their meetings that they were very popular and well attended.

One of the members was John Dalton, who later became a noted chemist, and another was the fine poet, Samuel Taylor Coleridge, then a student at Cambridge, so he could only come during vacation times.

In 1794 Fulton and Owen formed a partnership for Inclined Planes and Canal Excavations. Owen promised to advance the money and Fulton “to apply his whole time and exertions to the said business.” But the following spring, after a disappointment through the postponement of digging a canal at Gloucester, the two men dissolved the partnership by mutual consent. An unbroken friendship continued between them, and in old age Owen referred with pleasure to the fact that he had been able to advance Fulton in a career which later was of such benefit to the world.

In 1796 Fulton wrote to Owen that he had made an improvement in the “tanning business” and that it promised to pay well. This goes to show how many plans he carried in his fertile brain, but at this time he was chiefly concerned in canal work.

During this year he produced his first publication, "A Treatise on the Improvement of Canal Navigation," and signed it "R. Fulton, Civil Engineer." Much time was spent over this production for he illustrated it with seventeen plates and sent it broadcast to the distinguished men of the world. In several instances he wrote personal letters to accompany the book, by which he hoped to awaken wide interest.

He sent one letter to Governor Mifflin of Pennsylvania, another to Napoleon Bonaparte, and a third to George Washington, then President of the United States. This letter is interesting as showing how great a system of canal extension Fulton had in mind :

LONDON, Sept. 12th, 1796.

To His Excellency,

George Washington,

President of the United States :

SIR ;

By my Friend, Dr. Edwards, I beg leave to present you with this publication ; which I hope will be honored with your Perusal at a leisure hour : the object of which is to Exhibit the Certain mode of Giving Agriculture to every Acre of the immense Continent of America By Means of a Creative System of Canals :

When this Subject first entered my thoughts, I had no Idea of its Consequences : But the Scene gradually opened and at length exhibited the most extensive and pleasing

prospect of Improvements; hence I now Consider it of much national Importance; and View it like the application of those particular principles which produce certain effects:

Thus the discovery of the Mariner's Compass Gave Commerce to the World.

The Invention of printing is dissipating darkness and giving a Polish to the Mass of Men.

And the Introduction of the Creative System of Canals as certain in their effects will give an Agricultural Polish to Every Acre of America. I therefore Beg Leave to Submit to your Contemplation the Last Chapter with the Supplement; which Exhibits the specific System for America: And hoping that your Excellencies Sanction will awaken the Public attention to the Subject; I Remain with all possible respect, Your Excellencies

Most Obedient and Very Humble Servant,
ROBERT FULTON.

The letter, hopefully sent by a friendly hand, was duly received and politely acknowledged by our first president, who, on the 14th of December, expressed his thanks and confessed "the subject is interesting and I dare presume is well treated but as the Book came to me in the midst of busy preparatory scenes for Congress I have not had leisure yet to give it the perusal which the importance of such work would merit. I shall do it with pleasure, I am persuaded, when I have."

President Washington's letter must have seemed

somewhat disappointing, after waiting five months, but optimism was Fulton's strong point and he thrived on even a crumb of encouragement. Accordingly, the day after its receipt, we find that Fulton followed up the matter by another letter; it shows that the young American had, as a base for calculation, only the carriage rates from Lancaster to Philadelphia, yet with how sublime a faith he prophesies the extension of a canal from Philadelphia to Lake Erie, — the first prediction of the great Erie Canal! It was a brave flight of fancy but was actually realized during the early part of the next century, — Fulton having been the earliest to foresee its possibility.

He trusts that "His Excellency will soon have time to peruse his pamphlet on small canals 'in tranquil retirement from the busy operations of a Public life.'" He confessed that the greatest difficulty in the plan was to devise a method to raise the vast sum of money for the canals. At first thought, he considered them "national works," to be built at the expense of the government, but finally concludes that an incorporated company of subscribers should be formed who would pledge themselves to apply one half, or any agreed part, of their profits to extension as it would then be to their interest to promote the work and to guard the earnings.

Then Fulton includes other states in the calculation and predicts "a creative system which would fill the whole country and in less than a century bring water-carriage within the easy cartage of every acre of the American States, conveying the surplus labours of one hundred millions of men, and bind the whole in bonds of social intercourse."

Fulton wrote also to the great Napoleon and presented his plan with considerable originality. He said that "fear of envy or the criticism of ignorance is frequently the cause of preventing ingenious men from making important discoveries;" and adds, "the mechanic should sit down among levers, screws, wedges, wheels, etc. like a poet among the letters of the alphabet, considering them as the exhibition of his thoughts, in which a new arrangement transmits a new Idea to the world." He reminded Napoleon that "men of the least genius are the first to condemn and the last to praise a new idea, because they have not the sense to grasp the produce of genius when they see it."

It was rather a daring deed for a young engineer to venture to offer to Washington and Napoleon, world-famous men of their day, a new idea to benefit their respective countries. He also tried to influence public opinion in England by the

publication in the *London Morning Star* of some essays on Canal Navigation.

It is to be hoped that these literary productions brought some money to Fulton's pocket, for he was so interested in his canal project that he had not touched his painting for two years. He was on a fearless quest for new methods to solve world-wide problems. He dared to be original. Many a man who dared less has failed to bring valuable aid to humanity.

And so Fulton changed his career from art to invention, a turn in the tide of his thought which brought much good to the world. But he retained his love for beauty and his hand never lost its cunning; and later, in hours of leisure, he painted portraits as strong and expressive as in his younger days.

CHAPTER VII

ACHIEVEMENTS IN PARIS

IF we had time to trace all the events in Fulton's life during these busy years, they would tell us that the way to fame is by slow plodding. When we read about great men we ought to remember that they did not rise like rockets from the darkness but by slow, patient effort climbed into the light of fame.

During the year 1797 Fulton was encouraged, by the acceptance of his plan to build a canal from Paris to Dieppe and Cambrai, to move from England to France. He had earlier visited France to study the art treasures in famous galleries, but his journey this time assumed quite another aspect, for the two countries had been at war for four years. At this time, however, they enjoyed a short armistice, or period of peace, and Fulton took the opportunity to obtain a passport from the Directory, or French Governing Board.

He began about this time to try to devise a way to end warfare between nations, — a dream en-

joyed by many kindly men of this day, who have formed the Tribunal for Universal Peace at the Hague. With this thought in mind he planned to protect the seas, those vast waterways between continents. He urged Free Trade between nations, and wrote a paper on the subject to define his views. It shows how deeply he had studied that world-wide problem.

The age in which Fulton lived provided the tools to shape his life. When a boy, he had heard of the horrors of battles during the War of the Revolution, and had experienced later the joys of peace. Fulton was an ardent Republican and believed in the right of a people to rule their nation. When Great Britain began to lay claim to "supremacy on the sea" the statesmen of America felt some alarm. Not only had their ships to fear naval prowess, but there were pirates, whose plunderings were related with horror. These conditions caused Fulton to realize that the highways of the oceans must be made safe so that all the nations of the world could live in peace without fear of one another.

In 1798 Fulton wrote to a friend :

"A free trade, or in other words, a free ocean, is particularly Important to America. I would ask anyone if all the American difficulties during this war is not owing to the

Naval systems of Europe and a licensed Robbery on the ocean? how then is America to prevent this? Certainly not by attempting to build a fleet to cope with the fleets of Europe, but if possible by Rendering the European fleets useless."

From the foregoing we learn the reason for the secret invention he had in mind during the years he spent in France. Robert Fulton planned to build a boat to descend beneath the water, which should carry masses of gunpowder to be placed wherever desired. These bombs, as we would call them, could be set by time-clocks so that they would later discharge their fire. We are familiar enough with submarines, now that they are in use in our own and other navies, but how impossible such a contrivance seemed in Fulton's day! He called his invention "torpedo," a name which has since been universally used for all such submarine vessels. He had his inspiration for the name from a strange fish of which he had read in the travels of Sir Thomas Herbert, where it was described as a "Torpædo or Cramp Fish" which, when the explorer and his companion took in their hands, alarmed them so greatly that they trembled; for "it let forth a cold breath upon them, so they would be so frightened that they would let it go." You will see that Fulton's strange boat, like this

fish, was to let forth a strange breath of fire upon its enemies. He chose the name well.

This dreadful machine of war seemed indeed a curious instrument to bring peace. His plan was to manufacture so deadly a weapon of warfare that no nation would dare to enter into a battle on the seas.

Fulton had to tarry three weeks at Calais before his passport arrived. With this he soon reached Paris.

He found the city gay and happy, with all remembrance of warfare put away.

He sought lodgings at an excellent hotel where he was fortunate in meeting an American gentleman, Joel Barlow by name, and his wife. Between the three there arose a lifelong friendship of rare intimacy. Fulton was always happy in the selection of friends, in this instance particularly, for Barlow was a man of considerable distinction in literature, statesmanship, and philosophy. Fulton was a young man of agreeable presence and attractive manner and Mr. and Mrs. Barlow became greatly interested in him. When they moved into their own house, having no son of their own, they invited Fulton to live with them, and the friendship so strengthened that for seven years Fulton remained, almost as a son, in their home.

Mr. Barlow had been American Minister to Algiers, where he made important treaties and accomplished valuable diplomatic service in what was then a very difficult field. He was a man of wealth, and when released from office at the embassy, he moved to Paris where he could establish a home and live among his books and papers; for he was an industrious writer of political and historical essays.

Barlow interested himself in strengthening the friendliness between the United States and France. He knew the great men of both countries and by his side Fulton found genuine inspiration. He immediately set himself to the task of making drawings and plans to secure a patent for his Inclined Plane for Canal Navigation, which was duly granted on the 14th of February, 1798, — a pleasant valentine!

Again Fulton wrote to Napoleon and to other great men describing the invention, — in fact, the emperor was to hear much of the American inventor from this time on.

No sooner was he settled in Mr. Barlow's home than Fulton commenced the study of the French language, and later German and Italian. As his need arose, in the development of his inventions, he also studied higher mathematics, chemistry,

perspective drawing and physics. He was twenty-nine years of age at this time but was wise enough to know that "one is never too old to learn."

Of course he needed money and naturally he took up his brush to earn it. About this time he painted several portraits, one a fine likeness of his good friend Joel Barlow. West had probably given him letters of introduction to the artists of Paris, for Fulton was soon at home among them. Vanderlyn made a charming pencil sketch of Fulton; and Houdon, the famous sculptor, who had visited America with Benjamin Franklin, carved a marble bust of Fulton which is now preserved in the Louvre. During the Hudson-Fulton Celebration, this bust was reproduced in bronze for the New York Historical Society and also for the Metropolitan Museum.

The great men of the world are always the busiest. Fulton accomplished much during the fifty years of his life. He was never idle, and he made each day count for something. This is a good rule to remember, for so many days are likely to slip by without real result. The sum total of a life's work is only the mere addition of many so-called "small" duties.

Fulton still remembered his dear old mother in the distant farm-home of Pennsylvania, and in

1799 sent her so delightful a letter, with a present of thirty-six guineas, that you will want to read this proof of his faithful affection; and, perhaps, smile a little over his merry pleasantries about the French ladies, and his sturdy preference for the ladies of his own land.

PARIS, July 2, 1799.

MY DEAR MOTHER;

Still Europe holds me, not by ties of affection but by the bonds of business with which I am ever so much engaged that I have not had time even to fall in love: And now having arrived at the age of 32 years the ladies of my acquaintance, who, good creatures, are much concerned for my future happiness and honour, begin to fear that I shall die an Old bachelor; hence with eyes full of regard and the sweetest arguments they persuade me to avoid so miserable an end: In my own mind I have determined to avoid it but it is my intention to reserve all my affections for some amiable American whose customs and manners I prefer to anything I have yet seen in Europe. You will now ask when shall this be, — when will I return. This I will no longer promise because having promised frequently without being able to perform there is not much reliance in them: But still I hope the time is not distant when I will step into your little neat room, in one corner of which perhaps you have my picture, the only donation which I then had in my power to present, because being my own work it was attended with very little expense.

But in this letter I send you *thirty six* pictures of the late King of France, known in America by the name of French

guineas; these, my dear mother, I hope will be of use to you, and help to take some weight of cares off your weight of years. And each year I will endeavor to aid you in proportion to my circumstances.

I am in excellent health, six feet high and thin; this being thin I think rather an advantage because it suffers (allows) a man to be active. I would not be loaded with the quantity of fat which some gentlemen are obliged to carry into company, not for their whole estate. . . .

To Mr. Smith, my Sisters, Brothers in law and friends, remember me with love and friendship, and believe me everything which is right in an affectionate son,

ROBERT FULTON.

Fulton's mother died during this year, 1799, in the Pennsylvania farm-house, and it is doubtful whether his letter reached her. If it did, the thirty-six guineas, the "pictures of the late King of France," and the happy letter, with its promise of home-coming, must have gladdened her heart.

Before we take up the story of the submarine torpedo-boat work, — as difficult as that of his later invention of steam navigation, — let us recall another venture which Fulton made, along quite another line. Upon his arrival in Paris he had noticed the gayety and joyousness of the French and he decided to appeal to these happy people with a new form of amusement, a painted panorama.

It is only necessary to remind ourselves of the astounding popularity, in our day, of moving-pictures, to realize how fortunate Fulton was in his plan to amuse the people of Paris. A Scotchman, Robert Barker, had painted a panorama of the city of Edinburgh, to exhibit in London in 1789. Possibly Fulton had seen this exhibit, for it had proved highly successful; at any rate, he applied for a French patent, which was granted in April, 1799, to "Robert Fulton of the United States" for a term of ten years.

Fulton's panorama was almost twice as large as the Scotchman's. He secured a plot of ground in a central part of the city, and built a loft, in circular shape, upon it. The queer-looking building attracted immediate attention. In it Fulton hung the huge canvas, and his industrious hand painted the startling scene, "The Destruction of Moscow," a scene of pillage and devastation, such as Benjamin West had taught him to depict. The subject was attractive to the people, who were considering rumors of war, and they flocked in crowds to view the fiery representation. The entrance fee was a franc and a half, so money began to pour into Fulton's empty purse. So noted did the panorama become that a popular song of the day was sung in the streets extolling its excellence. One cannot

but wonder whether Fulton himself, perhaps at Barlow's suggestion, wrote the words to advertise the new amusement.

We can almost fancy that we see and hear the care-free crowd, strolling through the street, where now an arcade called "Passage des Panoramas" marks the place, singing the popular air as they crowded to the door of entrance, just as people flock to-day to an inexpensive and novel entertainment. Fulton was indeed a clever man to have adapted Barker's London success to the people of the French capital. Here is one verse of the song, with its translation :

"Paris pas plus grand que cela
Jouit de succès légitime
Un savant vous le montrera
Pour un franc cinquante centimes
Et tout le monde donne ou donnera
Dans le pano, pano, panorama."

(Paris more than any place
Rejoices in a lawful success.
A clever man will show it to you
For one franc fifty centimes.
And everybody goes or is going
To the pano, pano, panorama.)

This business venture proved very successful but Fulton was so busy with greater affairs that he

could not long give his personal attention to its supervision. In December of that year he sold the patent rights to an American who carried on the business for several years. Other scenes replaced the original "Moscow," possibly Fulton painted them; at any rate, he kept an interest in the business, and in 1801 took out a second patent for improvements in panoramas.

But Fulton longed to give to humanity something better than mere amusement, — he wanted to help them with their work, to make traveling easier, and, if possible, to banish warfare. His experiences with his submarine torpedo-boat will be told in the next chapter.

CHAPTER VIII

BUILDING THE FIRST SUBMARINE

AND now Fulton began to build his submarine torpedo-boat and named it *Nautilus*, meaning a sea-shell. He wrote a letter to the French Directory and offered to submit his plan and explain his engine to Napoleon, whom he had heard was "a good engineer."

The emperor was at the height of his power. With France and England at war, disturbed conditions prevailed throughout Europe and the unrest hindered all progress. Fulton offered to the French nation, through its governing body, his original weapon to secure their supremacy upon the seas throughout the world.

His letters on the subject, which must have seemed like fairy-tales, fortunately are preserved in the archives of France. In one he asked to be authorized to build the engine he had invented and to try it against the English fleet. He himself promised to make the trial and asked no other compensation for labor extending over eighteen

months than "the happiness of having contributed to the re-establishment of peace, the freedom of the seas and of commerce, and the consolidation of the Republic."

The Directory appointed a committee to consider Fulton's novel plan; they made a fairly favorable report, for, they said, "the inventor is no charlatan, for he proposes to captain his engine himself and thus gives his head as a hostage for his success."

But after several years of experiment and trial, Fulton was still far from finding acceptance of his plan. In 1797, when he began to devise it, he was possibly inspired by the work of an American, David Bushnell, of Connecticut, who had built a turtle-shaped boat to dive under water and attach an explosive to an enemy's boat. The device met with scant success in America, so Bushnell crossed to France, where he also failed to arouse interest.

Fulton's invention was far more powerful and *agile*, if we may use the word. It could sail like a common boat on the water, then dive below and remain under the water at any depth for more than six hours at a time; guided by a compass, it could move about with ease, and plant torpedoes where desired. Small wonder that the Frenchmen were slow to believe all the astonishing statements made in its favor by the enthusiastic inventor.

But Fulton stood ready to prove them. During the years 1799 and 1800 he was busy demonstrating the accomplishments of his novel craft. He launched it in July, 1800, and proceeded to make a series of experiments in the middle of the Seine where he could plunge twenty-five feet. He took two persons down with him and his tests were encouraging although the swift currents of the tide made him decide to remove the boat to Havre on the coast, where he could attempt feats in the open sea.

His queer-looking boat, six feet wide and twenty feet long, was towed on two barges to Havre, where four days later it arrived and Fulton proceeded to put her through all sorts of "paces." The vessel responded to his every wish and he imagined that universal peace would result from the use of the new subduing agent, the *torpedo*.

Great ideas move slowly, — their very immensity hinders quick progress. Fulton was under heavy expense in the building and testing of his strange boat. Barlow, who remained in Paris, wrote frequent letters of encouragement and forwarded drafts of money, profits which were Fulton's share in the earnings of the panorama. Repeated entreaties to the Directory finally gained attention, and Napoleon showed enough interest to appoint a committee to examine the queer-looking vessel.

To this committee Fulton eagerly explained his invention. He tells the story in simple language and it is so thrilling that a copy will prove interesting. He writes :

Not having had time to busy myself with the drawings and description of the latest changes I have thought fit to make in my *Nautilus*, I take the liberty to recommend the model of it to your examination as the best means of enabling you to judge of its form and combinations.

Although having exact details of experiments, I shall limit myself to rendering here a succinct account of the most important of them :

First Experiment: — The *Nautilus* is 20 feet long and 5 in diameter and according to the calculations of Citizen Guyton it will contain a quantity of air sufficient for 3 men and a candle for three hours.

Second Experiment: — On 24th of August, 1800, I plunged in the basin at Havre to the depth of 15 feet having with me two people and a lighted candle; we remained below the surface for the space of one hour without experiencing the slightest inconvenience.

Third Experiment: — On August 25th I tried to manœuvre the *Nautilus* by means of wings 4 feet diameter like the sails of a wind-mill; to this end at first I placed on the bridge two men with oars; they took 7½ minutes to row about 192 yards, the length of the basin; then I ordered the same 2 men to set the sails and in 4 minutes the *Nautilus* covered the distance to the starting place; — I proved by this that the speed of sails to that of oars is about 2 to 1 and that these sails are very suitable to manœuvre a boat under water. The success of this experiment has given me

several new ideas which I hope will facilitate much the use of carcasses [iron cases] of powder or torpedoes.

Fourth Experiment:—On the 26th of August I tried balancing the *Nautilus* under water in such a way as to prevent it rising towards the surface or descending to the bottom, meanwhile advancing. This is executed by means of a pair of wings placed horizontally on the front of the *Nautilus* and which communicates with the interior. By turning these wings from left to right the *Nautilus* is made to descend below the water, in turning them from right to left, it is raised to the surface. My first trial was unfortunate, in not having placed the boat in the necessary trim in order that the wings could act. The next day I had a decided success and I kept my *Nautilus* below water at a depth of about 5 feet whilst it covered a distance of 192 yards, about from one end of the basin to the other. This day I made several movements under water and I observed that the Compass acts as well under water as at the surface. The three people who have been my companions during these experiments are so familiarized with the *Nautilus* and have so much confidence at present in the movements of this machine that they undertake without the least concern these aquatic excursions.

Having thus assured myself of the ease of immersion and submersion of the *Nautilus* and all its movements as well as the effect on the compass, on the 27th of August I half filled an ordinary barrel and placed it at anchor in the harbour at about 426 yards from the jetty; — I seated myself then in an ordinary boat at the distance of about 160 yards and placed in the sea a torpedo containing about 30 lb. of powder; the torpedo was attached to a small rope 200 yards long; the current going under the barrel, the torpedo

passed without touching it; but turning the helm of the boat in which I sat, I made it go obliquely till I saw the torpedo exactly under the barrel; I then drew back the cable till at last the torpedo touched the barrel; at that instant the battery went off, the powder exploded and the barrel was reduced to fragments being lost in a column of water 10 feet in diameter that the explosion threw into the air to the height of 60 or 80 feet.

On the 12th of September I left Havre for La Hogue and in this little voyage my *Nautilus* sometimes did a league and a half ($4\frac{1}{2}$ miles) per hour and I had the pleasure of seeing it ride the waves like an ordinary boat.

On the 15th of September I put into a little harbour called Growan near Isigny at 3 leagues from the islands of Marcou. The next day the equinoctial gales commenced and lasted 25 days. During the time I tried twice to approach two English brigs which were anchored near one of the islands, but both times, whether by accident or design, they set sail and were quickly at a distance. During one of these trials I remained during the whole of one tide of 6 hours absolutely under water, having for the purpose of taking air only a little tube which could not be perceived at a distance of 400 yards.

The weather being bad I remained 35 days at Growan and seeing that no English vessel returned, and that winter approached, besides my *Nautilus* not being constructed to resist bad weather, I resolved to return to Paris and place under the eyes of Government the result of my experiments.

In the course of these experiments there has come to me a crowd of ideas infinitely more simple than the means that I have employed hitherto and in an enterprise so new and without precedent one ought to expect that new ideas should

present themselves, tending to simplify the execution of the great object in view.

As to myself, I look upon the most difficult part of the work as done. Navigation under water is an operation whose possibility is proved, and it can be said that a new series of ideas have just been born as to the means for preventing naval wars or rather of hindering them in the future; it is a germ which only demands for its developement the encouragement and support of all friends of science, of justice and of society.

Health and respect,

(Nov. 7th 1801.)

ROBERT FULTON.

It is almost beyond belief that Fulton had been able, in so short a time, to bring to such perfection an invention of such great importance, yet fraught with so much danger. The recital of his voyage on the high seas, at war-time, together with his plunging experiments, proves that he possessed real heroism. The navy of England had received private news of the invention and the sailors were on their guard, so it is easy to realize why the brigs "set sail and were quickly at a distance." Fulton had become well known in both warring countries and was accounted a power to be reckoned with.

Fulton offered personally to command the *Nautilus* and to teach the French navy the art of the new warfare, as well as to build such submarine

boats as Napoleon would authorize. He asked that he might employ as co-workers the three men he had already taught; and they, by the way, must have been courageous indeed to engage in so novel and dangerous an enterprise.

But the contract "backed and filled" in tantalizing delay to the ardent inventor. Fulton had a personal interview with Napoleon and tried to persuade him to adopt the new plan; but no immediate response resulted; finally, after hope long deferred and repeated letters and visits to the embassy, Fulton received a letter from the Minister of the Marine, bearing the good news that Napoleon had accepted Fulton's proposition; that 10,000 francs had been placed to his credit to repair the *Nautilus*, build auxiliaries, and convey his unusual fleet, at his own expense, to Brest, where he could engage in warfare against the enemy.

From that time, March 28th, 1801, to May, Fulton was busy with the novel enterprise. The *Nautilus* was overhauled and conveyed to Brest, mounted on a long cart drawn by horses. How the boys and girls of the villages through which the queer boat passed must have gazed and wondered! Finally it reached the dockyard at Brest, and after two months of fitting Fulton was ready to attempt an attack on the enemy. But again

the English seamen were too wary to be surprised. Fulton spent an anxious summer but could find no vessel within reach of possible attack.

However, he conducted a series of successful experiments, and, in the presence of several influential officials, he blew up a large sloop, destroying it so completely that nothing was left but the buoy and cable. He was able to report that he had proved his boat could

Sail like a common boat,
Obtain air and light,
Plunge and Rise perpendicular,
Turn to the right and left at pleasure,
Steer by the compass under water,
Renew the common volume of air with ease
And add the respirable air, by a reservoir, which may be
obtained at all times.

Although the invention proved successful, it was exercised for only eight months. On the first of October the Minister of the Marine resigned his office, and his successor, a French admiral of the old-school, declined to listen to or forward any new-fangled ideas. How disappointed Fulton must have been after his three years of hard work and his unquenchable faith in the power of his project. The Treaty of Peace, signed at Amiens in 1802, brought a welcome end to warfare, and Fulton

realized that the nations had no present need for his weapon of naval destruction.

But Fulton did not forget France and the interest Napoleon had shown, even after his return to his own country. In 1811, the *Boston Weekly Messenger*, of Friday, November 15th, contained the following amusing letter in rhyme, addressed to Napoleon's infant son, the King of Rome. Perhaps it was a diplomatic move to interest Bonaparte through a recognition of his tiny heir; perhaps it was merely written in jest and never crossed the seas. But here it is, in part, for our amusement.

Great King, two years ago I wrote
To Lord Marbois a civil note,
Which he ne'er answered, like a bear,
So now I send my modest prayer
To your dread throne, or stool, or chair.

The plan, my lord, which I have hit on
Will quite destroy the pride of Britain;
The great torpedoes I prepare
Will blow her ships up in the air,
And every man-of-war will soon
Ascend just like a vast balloon.
In half a day one thousand men
Would scatter all the ships you ken,
Would clear the Channel and do over
All between Calais port and Dover;
Thus in two years, Sir, might be seen
The end of England's proud marine;

And then that Isle, without a doubt,
Puffed like a farthing rush-light out,
Instead of reigning o'er the waves
Would only furnish France with slaves.
How glorious then were such a thing
To grace your annals, mighty king!
And (turn it over in your mind)
How happy 'twere for all mankind,
And more, (but that's a thing between us)
How worthy of your daddy's genius;
This business will be done — this blow up
Take place, great Monarch, ere you grow up.
Reflect, Sir, powder was invented:
And then, Sir, you must feel contented.

Now, Sir, soon as the haughty foe
Shall feel a meditated blow,
Their ships, perhaps, they will abandon,
That you with ease their coasts may land on;
Or, England, if I don't befriend her,
May quickly all her fleets surrender.

Now rendered master of the seas,
You may let ports out as you please;
These can be rented, understand,
Just as some kingdoms are on land;
England, then prostrate at your feet,
For peace, on any terms, may treat;
Be this your language firm and bold,
"While yet the brand of war I hold,
As you are most completely beaten,
This basis only will I treat on —
That you, without the least delay,
Two millions to Bob Fulton pay."

CHAPTER IX

BUILDING THE FIRST STEAMBOAT

FOR the time England and France were at peace. No need now for weapons of warfare, so Fulton set aside his plan for submarine torpedo-boats and began to devote his attention to an idea of greater importance, — the invention of a steamboat.

The thought was not new to him for he had pondered over it since 1793 when he had submitted a description of an original model to Lord Stanhope. Now he bent all his energies to the task and commenced a series of new experiments.

He made many sketches of engines, paddles and boats. Some are yet in existence, notably one made June 5th, 1802. It bears a pen-drawing of a steamboat, with side paddle-wheels, a forward smokestack, a covered cabin amidships, with upper deck occupied by imaginary passengers, a pointed bow and a square stern, — not in reality the shape of the later product of his skill, but a fanciful sketch of the form then in mind. How far ahead his imagination darted, in time and space, may be

seen from the inscription, "The Steamboat from New York to Albany in 12 hours." It was a brave prediction!

In 1804, when General Armstrong was appointed Minister to France, he lived in the house formerly occupied by Joel Barlow; and upon the walls of Fulton's room he found plans of steamboats sketched, as a panorama. Even then the thought had so taken possession of Fulton's mind that he lived with it day and night.

By this time Fulton was recognized by thoughtful men as a power to be considered. At Barlow's hospitable home Fulton enjoyed the opportunity of making friends among prominent men; and during 1801 there arrived in Paris, as Minister Plenipotentiary of the United States, Chancellor Robert R. Livingston, a noted American statesman and lawyer. The meeting between Fulton and Livingston, at Barlow's table, proved important. Mr. Livingston's keen intellect had already recognized the importance of providing boats with steam power. Indeed, he himself had experimented in the matter, and had caused an Act to be passed by the Legislature in 1798 granting to himself "the exclusive right and privilege of navigating all kinds of boats which might be propelled by the force of steam or fire, on all waters of the state of New

York, for the term of twenty years from the passage of the Act; upon consideration that he should within a twelve-month build such a boat, the mean of whose progress should not be less than four miles an hour."

The Act was passed but Livingston's steamboat was not a success. The trial boat, of thirty tons' burden, built by the Chancellor's orders by an Englishman named Nesbit, near Tivoli on the Hudson, failed to run! When the Chancellor met Robert Fulton, this clean-cut, energetic young countryman who had built a much-talked-of submarine torpedo-boat recognized by Napoleon, he thought, "Here is the clever man whom I am seeking!" It is characteristic of great men to notice the mental worth of others and enlist it in their cause, whatever it may be. And Livingston quickly learned the rare capacity of Fulton.

There could have been no stronger combination than the partnership of these two men, formally enacted at Paris, in October, 1802. The original agreement is signed "Robert R. Livingston of the state of New York, and Robert Fulton of the state of Pennsylvania."

Fulton's part of the contract was:

1st: To build a boat one hundred and twenty feet long, eight feet wide, to draw fifteen inches of

water, to navigate the Hudson River between New York and Albany, at a speed of eight miles an hour and to carry sixty passengers, allowing two hundred pounds' weight per passenger.

2d: To secure a patent, in the name of Robert Fulton; to deposit every necessary drawing, model and specification, and the patent property when granted was to be divided in value into one hundred shares, half of which should be owned by each partner, and all profits equally shared.

3d: To go to England to construct an experimental boat, — if possible borrowing an engine, — the cost of such boat, five hundred pounds English currency, to be provided by Livingston. If the boat failed of success, Fulton was to repay half the sum with seven per cent interest added; if it succeeded, Fulton was to go to America, obtain a patent, and build a boat; his "reasonable expenses" to be part of the general expense.

The contract continued as follows:

4th: When the work is finished, either partner may dispose of, or sell, any number of shares less than forty, but the purchasers, or shareholders, are to have no vote in the management of the business. All extensions to be paid from revenue received, and the profits equally divided twice a year.

5th: The partnership is to continue while the patent lasts, that is, fourteen years, or as long a term as it extends; at its close, all boats, warehouses and other property to belong to the shareholders.

6th: If Fulton or Livingston die before the termination of the patent, each heir or assign, holding twenty shares, shall become an active partner with power to act.

7th: Livingston reserves the right to withdraw from the partnership any time after his five hundred pounds have been spent in the first experiment, but is to be considered a partner until he sends notice in writing to Fulton.

It is evident that the document was drawn by Livingston, who certainly made a good bargain. The sole responsibility he took upon himself was the investment of five hundred pounds — twenty-five hundred dollars — with a return of one-half the amount, plus seven per cent interest, if Fulton failed to provide the invention. On the other hand, he was entitled to receive dividends as long as the patent rights could be extended, if the invention proved, as it did, financially productive.

For practical reasons, Fulton decided to build his trial boat in Paris, instead of going over to England. This decision was probably made when he found

that he could borrow, or rent, an engine. Fulton had to consider expense, for he had spent the money he received from the Panorama upon his torpedo-boats; and his active mind conceived such vast schemes that they seemed too costly to all his friends, except Barlow; at times, even he advised against too great ventures. On July 26th he prudently wrote as follows:

“My project would be that you pass directly over to England *silent and steady*, make Chapman construct an engine of 12 inches, while you are building a boat of proportionate size. Make the experiments on that scale all *quiet and quick*. If it answers, put the machinery on board a vessel and go directly to New York, (ordering another engine as large as you please to follow you) then secure your patent and begin your operation, first small and then large. I think I will find you the funds without any noise for the first operation in England and if it promises well you will get as many funds and friends in America as you want. I should suggest a small operation first, for several reasons; it can be made without noise; you can easier find funds for a small experiment,” etc.

After the contract was signed there was no hesitation on the part of Fulton; he plunged at once into the task he had anticipated for many years. As early as 1793 he had written to his friend Lord Stanhope, giving his first thoughts on the subject, — one part of his long letter will be enough

to quote here; it is of special interest because it shows that Fulton looked to nature to suggest a practical plan:

“In June, '93 I begun the experiments on the steamship; my first design was to imitate the spring in the tail of a Salmon—for this purpose I supposed a large bow to be wound up by the steam engine and the collected force, attached to the end of a paddle—to be let off which would urge the vessel forward.”

This accords with an old newspaper clipping which states that “the first rough model of a steamboat made by Fulton in New York was cut out of a shingle, shaped like a mackerel, with the paddles placed further in front than behind, like the fins of a fish.”

Of course these “natural propellers” gave ideas to the inventor; he noticed that a fish with round, unbroken tail is a slow swimmer, while those which have deeply indented tails, like the mackerel, can make far greater speed in swimming.

Fulton experimented for nine years before finding the best method; he did not stumble upon the plan, but patiently worked it out, learning through each successive test—all noted and recorded,—the correct ratio to establish between the size of the boat and the power of the machinery.

During the early spring the boat was finished

and looked so promising that Livingston wrote to friends in America to enact an extension to himself and Fulton, jointly, for the exclusive right to operate steamboats on the waters of New York State for twenty years, provided the boat could be produced within two years. Later this time was extended.

Success seemed certain to both Fulton and Livingston. The strange boat was launched upon the river Seine; the borrowed engine of eight-horse power was installed; the copper boiler was in place, — and the partners, disregarding the jeering remarks of ignorant bystanders, were hopeful and happy in anticipation of the trial trip which was set for an early date.

Naturally, the new invention was talked over by the wise men of the city who wandered to the dock-yard to view the queer-looking boat. It is said that Prince Tallyrand, during a dinner at Mr. Barlow's home, sat beside Robert Fulton and was charmed by his pleasant manner. Fulton's topic of conversation — we can imagine his pleasure in the subject — was his invention of the steamboat upon which he was then at work; and his hope that the submarine torpedo-boat would end all naval warfare and bring universal peace. The Prince listened politely but later confessed his sadness in

realizing that the agreeable young American was mad or he would not devote his time to such impossible schemes! To many Fulton's dream seemed utterly vain.

This idea gained strength by the disaster which befell the steamboat just before the time set for her trial trip. She was completed; and Fulton, too excited to sleep although wearied by long labor, restlessly awaited the day to dawn when he could prove her success. During the night a great storm broke over Paris; the rain fell in torrents accompanied by heavy winds. At daybreak Fulton was aroused by a breathless messenger whose anxious face and haste betokened bad news. He was the watchman in charge of the precious invention. He rushed into Fulton's bedroom, with the exclamation:

"Oh, sir, the boat has broken in pieces and gone to the bottom of the river!"

Fulton arose in dismay, hastily dressed, and rushed to the scene. The news was all too true! The boat, too weak in structure to bear the heavy machinery, buffeted by the high waves and heavy winds, had broken in the middle, depositing the valuable engine and other machinery in the river. Nothing was in sight above the water!

Fulton later confessed to a dismay never felt at

any other time. Many a man, at this point, would have given up the whole project in despair. But this crisis of apparent failure was the moment for Fulton's strength of character to assert itself. After months of labor the borrowed engine and Mr. Livingston's money seemed forever lost. But Fulton set himself to the task of making the best of this disappointment. He wasted not a moment in vain regret, but without going back to his home for breakfast, he began, with his own hands, to try and rescue the boat. For twenty-four hours he worked, without food or rest, until — wet and weary but triumphant — he recovered the machinery and engine. They were found to be little hurt, although the boat itself was a total wreck. But, alas, Fulton paid a heavy penalty for over-taxing his strength; for a permanent weakness of the lungs, from which he never fully recovered, resulted from the exposure and long struggle in the water to save his precious invention. At no moment in his life did he display such fine courage as at this time of apparent failure.

Fulton immediately began to build another boat, in which he placed the recovered machinery. By the month of July he was again ready to show his friends and the French scientists the working-power of his invention.

Mr. Fulner Skipwith was then our Consul-General in Paris. He was interested in the idea of steam navigation, and during the preceding year had sent a letter of inquiry regarding it to Robert Fulton, who gladly answered his questions. Mr. Skipwith had married in Paris, while Fulton was busy with his torpedo experiments on the French coast, and the Consul-General's first child was born during the spring of 1803. This accounts for the merry letter of invitation which Fulton sent him on July 24th.

MR. SKIPWITH;

MY DEAR FRIEND,

You have experienced all the anxiety of a fond father on a child's coming into the world. So have I. Your little cherub, now plump as a partridge, advances to the perfection of her nature and each day presents some new charm. I wish mine may do the same. Some weeks hence, when you will be sitting in one corner of the room and Mrs. Skipwith in the other learning the little creature to walk, the first unsteady step will scarcely balance the tottering frame; but you will have the pleasing perspective of seeing it grow to a steady walk and then to dancing. I wish mine may do the same. My "boy," who is all bones and corners, just like his daddy and whose birth has given me much uneasiness, or rather, anxiety, — is just learning to walk and I hope in time he will be an active runner. I therefore have the honour to invite you and the ladies to see his first movements on Monday next from 6 till 9 in the evening between

the Barriere des Bons Hommes and the steam-engine. May our children, my friend, be an honour to their country and a comfort to the grey hairs of their doting parents.

Yours,

R. FULTON.

You see Fulton considered his boat as a son, as dear and as promising!

This second time the boat did not disappoint him. In the presence of the invited guests, it moved successfully forth from the dock and steamed its way along the river, receiving the applause and admiration of the group of friends assembled by Fulton and Livingston. A public trial followed about two weeks later and a newspaper of the day described it so fully that a translation is here printed:

On the 9th of August, 1803, a trial was made of a new invention and its complete and brilliant success should have important consequences upon the commerce and internal navigation of France. During the past two or three months there has been seen at the end of the quay Chaillot, a boat of curious appearance, equipped with two large wheels, mounted on an axle like a chariot, while behind these wheels was a kind of large stove with a pipe, as if there were some kind of a small fire engine intended to operate the wheels of the boat. Several weeks ago some evil-minded persons threw this structure down. The builder, having repaired this damage, received, the day before

yesterday, a most flattering reward for his labour and talent.

At six o'clock in the evening, aided by only three persons, he put his boat in motion, with two other boats in tow behind it, and for an hour and a half he afforded the curious spectacle of a boat moved by wheels like a chariot, these wheels being provided with paddles or flat plates, and being moved by a fire engine.

In following it along the quay, the speed against the current of the Seine appeared to us about that of a rapid pedestrian, while in going down-stream it was more rapid; it was manœuvred with facility, turning to the right and left, came to anchor, started again, and passed by the swimming-school.

One of the boats took to the quay a number of savants . . . who will make a report which will give to this discovery all the praise which it deserves; for this mechanism applied to our rivers, the Seine, the Loire, and the Rhone, should result most advantageously to our internal navigation. The tows of barges which now require four months to come from Nantes to Paris, would arrive promptly in 10 to 15 days. The author of this brilliant invention is Monsieur Fulton, an American and a celebrated mechanician.

Napoleon's watchful eye was upon Fulton for he wrote on July 21st to the Councillor of State in the Department of the Marine as follows :

"I have just read the project of Citizen Fulton which you have sent me much too late *in that it may change the face of the world*. However that may be, I desire you immediately to confide its

examination to a commission of members chosen by you from among the different classes of the Institute. It is here that learned Europe would seek for judges to solve the question under consideration. As soon as the report is made it will be sent to you and you will forward it to me. Try and let the whole matter be determined within a week as I am impatient."

We may be sure that Fulton welcomed the questions of these learned men, and sent them "an invitation to see the experiment of a boat ascending the stream by means of a steam engine," as their records show. He had previously made an offer to Napoleon to convey his troops to England for an attack, saying:

"The sea which separates you from your enemy gives him an immense advantage over you. Aided in turn by the winds and the tempests he defies you from his inaccessible island. I have it in my power to cause this obstacle which protects him to disappear. In spite of all his fleets and in any weather I can transport your armies to his territory in a few hours, without fear of the tempests and without depending upon the winds. I am prepared to submit my plans."

No wonder Napoleon was impatient to learn more about Fulton and willingly admitted that his invention might "change the face of the world." Bignon, the French historian, wrote in 1829 that

had Napoleon listened to Fulton this important letter might have changed the history of Europe. He supposes that had there existed a single steamboat in France at that time, the workshops would have immediately been busied in 'multiplying the original.' In a few years one or two hundred steamships, towing behind them transports filled with soldiers, would have been ready with their leader for the boldest of enterprises. Bignon declared that the men and the times alike were ready for the novelty. England would have been forced to submit to the terms of peace laid down by France. "Thus may the fate of nations depend upon a new idea; thus nature conceals within her bosom many unknown forces of which a single one is sufficient to change the destiny of the world."

But Napoleon did not embrace the opportunity. His secretary said that when he presented Fulton's memorial to him he exclaimed disdainfully, "Bah! Away with your visionists!"

And Bignon, who took the trouble later to talk with the members of Napoleon's commission, said that they excused their lack of appreciation by the statement that Fulton's plan was accompanied by a number of "foolish ideas" which obscured their view of the great underlying truth. "Put not your

trust in scientists," exclaims Bignon, in the light of Fulton's success.

However, Lord Acton, the English authority upon this period of the world's history, when asked what event he considered of greatest importance in the 19th century, replied, "The sinking of Fulton's boat on the Seine," meaning that accident alone turned Napoleon from its acceptance.

The words of several historians prove that the sunny day when Fulton's steamboat voyaged back and forth upon the waters of the Seine, riding in triumph over the hidden wreck of its ill-fated predecessor, was really a great moment in French history!

Fulton was master of its movement and supremely happy in his accomplishment. He saw, with unshaken faith, as it is easy for us to see to-day, in a review of the history of the past century, that his twice-built boat on the river Seine was the forerunner of all the gigantic fleets of steamboats which now ride upon the waters of the world.

CHAPTER X

IN HOLLAND AND ENGLAND

I HAVE said that Fulton gave up his art, but only as a profession, for during the years he spent with Mr. and Mrs. Barlow he painted not only the panorama but several fine portraits. He made two oil portraits of Barlow, one as a gift to him, the other to keep for himself; as is proved by the fact that one is now owned, through inheritance, by a member of the Barlow family, the other by a descendant of Fulton. He mentions in a letter having painted a portrait of Mrs. Barlow, but this cannot now be found.

Joel Barlow had been engaged for some years in writing a long epic poem, "The Columbiad"; a review of Columbus's discovery and the colonization of America; the establishment of the republic; the habits of the Indian inhabitants; the gradual growth of American welfare and peace. It was a long recital, in lofty sentences. Columbus, the discoverer, was the hero, pining in a foreign prison when Hesper, the evening star, enters his cell.

In thought she leads the captive to a mount of vision and unrolls upon a screen all that has happened and all that shall happen in the land Columbus discovered. The theme was vast and proved a pleasant and prolonged study for both Barlow and Fulton. The latter was so inspired by the flowing stanzas that he made twelve illustrations which were skilfully engraved for the large volume, published in 1807, at an outlay of nearly five thousand dollars. This was generously defrayed by Fulton to show his appreciation of Barlow's many kindnesses.

The poem did not meet with much success. Public appreciation failed to crown it with approval; but as an example of loyal and generous affection between friends it will always command interest.

We now come to an interesting turn in the tide of Fulton's affairs. He had proved that the steamboat would run upon the waters of the Seine; he had entered into a partnership with Chancellor Livingston to go to New York to build a boat for traffic on the Hudson River between New York and Albany; but the agreement, you remember, included Fulton's return to England to order a suitable engine.

Accordingly, Fulton wrote a letter to Boulton

& Watt, at that time the most famous engine-makers in the world, and inquired the price of the engine for which he sent a descriptive drawing. He wanted only parts of the machinery, — the cylinder of twenty-four horse-power, the piston-rod and piston, the valves and movements for their opening and shutting; the air-pump and condenser; all the other parts, he explained, could be made in New York, “as they require a particular arrangement which must be done while I am present.”

He had to get a permit to export the engine, so Fulton asked the builders to ship the engine to Mr. Brockholst Livingston, through the American Consul, in whose hands he placed the money for payment. He said that if any difficulty arose about getting the permit, he would seek it through the American Minister, James Monroe.

Boulton & Watt's reply appears to have been disappointing, for a month later Fulton wrote to repeat the order and asked haste in its fulfilment, as “communication between France and England is daily growing more difficult.” Four weeks later the engine-builders declined the order, as they could not get permission to export the machinery. This was certainly discouraging, as France and England were again declaring war against each other; but

Fulton traveled over to Holland, and wrote from there to Mr. Monroe, asking his assistance, and adding:

. . . "Your desire to see useful arts introduced or created in our country is the strongest reason for your urging the permission and accepting no refusal; the fact is I cannot establish the Boat without the engine. The question is then — shall we or shall we not have such boats?"

At the same time Fulton sent a second entreaty to Boulton & Watt, telling them of his request of Mr. Monroe, and renewing the order. He says, "It gives me pain to trouble you on a business so insignificant, but I have no confidence in any other engines, and hope you will give me the necessary information on the Boiler and other parts so as to produce the best effect. I wish exceedingly to be obliged by you."

But no reply came to either of these letters, and Fulton's plan for the American steamboat seemed doomed to disappointment. Again he wrote to Mr. Monroe, but the diplomat probably hesitated to ask for a permit officially refused to an English firm of established reputation, and in behalf of an American enthusiast, already under watch by naval authorities. For the British had kept informed concerning Fulton's submarine torpedo-boats, and at the suggestion of the English states-

man, Lord Stanhope, they thought it best to have Fulton on their side of the channel. Accordingly, Lord Sidmouth, then Prime Minister, contrived a meeting with Fulton in Paris and persuaded him to take the trip to Holland, where, on neutral ground, he could confer with a representative of the British government.

Fulton thus described the meeting: "About this time, May, 1803, there was a gentleman in London, Dr. Gregory, who had known me in Paris for some years. I had many conversations with him upon my inventions and their probable success." It was this Dr. Gregory whom Lord Sidmouth sent to talk to the inventor.

Fulton described his invention to Dr. Gregory and offered to put the English government in full possession of the combinations and movements of submarine torpedo-boats, so that any good engineer could make and navigate them; he also promised full directions for making submarine bombs and to explain the many ways to use them.

Dr. Gregory asked Fulton to go to Holland to await a reply. He promised to bring it in person, passing, for political reasons, under the assumed name "Smith." For three months Fulton waited in Amsterdam, until "Mr. Smith" arrived in December with unsatisfactory proposals from the

government. Fulton declined these, but drew up another form of proposal for "Mr. Smith" to take back to England. Then Fulton returned to Paris.

The following March "Mr. Smith" arrived in Paris with a letter from Lord Hawksbury; it was encouraging; and Fulton decided to go to London to consider an engagement by the British government.

Busy days followed as Fulton made ready to take his final farewell of France. Barlow also was about to return to America, to spend his last days in peaceful retirement. Before leaving, Fulton packed a great number of his drawings and papers in a large box to ship to America; but the vessel was wrecked at sea and the box, when finally recovered, was so wet that much of the writing was impossible to decipher. Cadwallader Colden, who wrote the first life of Fulton, laments this accident and gives it as the chief reason that so little is known of Fulton's life in England and France. But by the light of many gathered facts, the story of the years has been pieced together.

Napoleon was ready to declare himself emperor, and this took place on May 18th, 1804. This act was a disappointment to Fulton who had hoped that the French Revolution would result in the

formation of a republic. He and Barlow were both glad to leave Paris at this time. Indeed, Fulton's contract with Livingston necessitated his trip to England to get the engine, so the overtures of the British statesmen came just at the right time. Rebuffed and disappointed, after years of waiting for Napoleon's recognition of his plans, Fulton, as a neutral, had perfect liberty to transfer his interests as well as himself to another country. He embarked for England in May, and in due season reached London.

CHAPTER XI

EXPERIMENTS WITH A SUBMARINE

LORD HAWKSBURY wrote Fulton, "If you should be disposed to accept active employment from the British government, you may rely on the most liberal treatment and recompense proportioned to your efficient service." No wonder that Fulton departed happily from France.

Arriving in London, he established himself in lodgings and tried once more to order the engine for the American boat; he also tried to induce the British Ministry to accept his submarine torpedo. As his work in France had been publicly known, he signed his letters to the English statesmen "Robert Francis," an assumed name which was no secret to the English but served to protect the torpedo project from the notice of French spies, should there be any.

At Boulogne, Napoleon was gathering his army for a possible invasion of England. France, enriched fifteen million dollars by the American purchase of Louisiana, was prepared to strike a new

blow. History made rapidly during those days; maps and ruling powers were changing. Fulton swung his energies to a fresh scene of action at a crucial time.

He was indeed "playing with fire." Fulton's danger during his submarine experiments in the harbor of Brest, was small compared with the risk he would run should he fall into the hands of the French while using torpedoes against them. Fulton had been told by Napoleon's commission that any one employing such weapons of destruction would certainly be hung if captured by the enemy; how much greater the likelihood now if France found the spurned machines effectively turned against Napoleon's troops.

For so it was. Fulton was in England only two days when he proposed to the Ministry a practical trial of his plunging vessel, describing it as thirty-five feet long, having power to sail like an ordinary fishing-boat, with a capacity for machinery and provisions for six persons for twenty days at sea, capable of plunging and remaining three hours under water without aid. When necessary to renew air, the boat need not appear above the water, but approaching the surface, could project two tubes, one to discharge the foul air already breathed, the other to take in fresh air, accomplish-

ing the change in two minutes, when the boat could plunge again to remain another three hours below.

In this manner he promised that a crew could conceal themselves under water during a day of twelve hours, on renewing the air three times, and could remain many days in the neighborhood of an enemy without detection.

He proposed a submarine expedition to destroy the French fleets at Boulogne and Brest "as they now lie." It was a daring plan, but Fulton admitted no possibility of defeat and offered personally to conduct the siege. He asked the aid of a good machinist to assist in fitting out the vessels, and an active sea-officer with power to choose one hundred hardy seamen from the fleet who were good swimmers, — also about forty tons of powder and seven thousand pounds, English money, to fit out the expedition.

But the British halted their judgment. Delay was irksome and Fulton urged the appointment of a committee to consider his plan.

Lord Sidmouth, who had sent Dr. Gregory to call upon Fulton in Paris, was no longer in power; but had been succeeded by the Right Honourable William Pitt, a relative of Lord Stanhope. The latter, with Lord Viscount Melville, First Lord of

the Admiralty, finally drew up a contract, which was witnessed by Sir Home Popham, and was signed by Fulton in his own name.

Although Fulton was officially engaged by the English government, his plan was still under consideration, and the actual expedition met with several postponements. Pitt, although impressed by Fulton's drawings and arguments, said that if the torpedo were introduced into naval practice it would in time destroy all military marines, and, as England's pride and strength was in her navy, he hesitated to encourage a plan which might injure it.

In fact, Pitt was hoping for peace rather than war; and for several months the project languished.

We can imagine with how much pleasure Fulton accepted an invitation to breakfast with Mr. Pitt on the 20th of July at his country house near Putney Common. Sir Home Popham also was present and Fulton noted that "Lord Melville was expected but did not arrive."

Fulton noted in his book of memoranda, that "during breakfast he explained the general principles of submarine navigation and attack which appeared to give pleasure and make a strong impression." The enthusiasm of the inventor

prevailed. Little by little he won by argument the approval of the half-sceptical British statesmen.

Finally Mr. Pitt directly asked Sir Home Popham if an agreement could be reached and Sir Home assented, saying Mr. Pitt's "perusal and signature alone were wanting." Then Mr. Pitt read and signed the papers, and delivered them to Sir Home Popham, with orders to call upon Lord Melville for his signature.

This was another red-letter day in Fulton's history, — indeed in the history of the world's naval warfare. For the signed papers were a contract with the inventor to fit out a British torpedo expedition against the French fleet at Boulogne. Sir Home left early, bearing the precious documents, and Mr. Pitt when alone with Fulton remarked upon the extraordinary invention which seemed to "go to the destruction of all fleets."

Fulton replied, "It was invented with that view." He added in his book of memoranda :

"As I had no desire to deceive him or the government, I did not hesitate to give as my opinion that this invention would lead to the total annihilation of the existing system of marine war."

"But," said Mr. Pitt, "in its present state of perfectionment those who command the seas will

be benefited by it, while the minor maritime powers can draw no advantage from what is now known."

"True, unless plunging or submarine vessels were introduced into practice," answered Fulton. "It probably would be some years before any nation could bring such a vessel to perfection — at all events there would be time to fit future politics to future circumstances; if at present the French preparations can be destroyed by submarine attack, it will convince Bonaparte and the whole world that Frenchmen never can make a descent on England, for any future fleet prepared by them may be burnt in like manner."

Fulton notes that little more was said. It was agreed that the torpedo attack should take place at Boulogne as soon as the engines could be prepared, and, after agreeing to call again upon Mr. Pitt during the week, Fulton returned to London.

But the acceptance was for only one-half of his project. Torpedoes were to be used, set with clock-work for future explosion, and these weapons, leaded so they floated below the surface of the water, were to be towed by catamarans, or rafts, consisting of two long sidewise planks, so placed that a man sat between them on a submerged seat. He guided the raft toward the enemy's

ship, attached the torpedo to the anchor-cable, and then paddled away, under water if need required, leaving the clock-work agent of destruction to float broadside beneath the vessel, with the turn of the tide, for later explosion.

In the dusk of the evening of October 2d, 1804, several catamarans, led by the flag-ship *Monarch* with Admiral Keith in command, stole quietly into the harbor of Boulogne. Seamen, in black jerseys, waistcoats and trousers, with black caps pulled over their faces, managed to paddle each raft into position, attach the torpedoes and get away in safety. But the French ships swung about and avoided the bombs; only one wrought destruction upon a small vessel with a crew of twenty-one men. The other bombs drifted ashore and exploded without serious harm, and at early dawn the British sailed away, without losing a man, but with so slight accomplishment that it was termed a failure. Fulton was present, as were also Sir Home Popham and Viscount Melville. The inventor's disappointment must have been great.

The attack was followed by a storm of protest in England. It was considered unlawful warfare, — the just idea of mercy construed as unfair such a form of siege. Others made fun of it, and

a merry wag wrote a ballad for the newspaper, supposedly sung by the Secretary of War :

See here my casks and coffers,
With triggers pulled by clocks!
But to the Frenchman's rigging
Who first will lash these blocks?

Catamarans are ready,
(Jack turns his quid and grins)
Where snugly you may paddle
In water to your chins.

Then who my blocks will fasten,
My casks and coffers lay?
My pendulums set ticking
And bring the pins away?

"Your project new?" Jack mutters,
"Avast! 'Tis very stale, —
'Tis catching birds, land-lubbers,
By salt upon the tail."

In December another trial of the submarine torpedo-boat was made against the Red Fort in the harbor of Calais. Only one of the two bombs exploded and little damage was done.

So passed several months, — months of entreaty on Fulton's part, — months of cautious planning on the part of the British statesmen. It was an open secret that they did not like that sort of warfare. Any man less persevering than

Fulton would have thought their lack of interest a sufficient dismissal.

But Fulton eagerly continued to plead for a more extended trial of his new device. He explained that the partial failure of the early attempts was due to lack of knowledge in the men employed to handle the explosives. He lost no faith in his plan and urged that it be adopted "as a system" by the English fleet. Finally his persistence was rewarded; Mr. Pitt gave permission for a public demonstration of his plan at Walmar Roads, near Deal Harbor, within a mile of Mr. Pitt's country residence, Walmar Castle.

Fulton secured the Danish brig *Dorothea* — a prize of war — and anchored her within safe range from the shore, in easy sight of the crowd of distinguished visitors whom he invited to witness the experiment. The rumor spread that "Mr. Francis," who had invented and built the machines used by Sir Home Popham against the enemy's ships at Boulogne, was to try to blow up a three hundred ton brig with one of his novel catamarans. A multitude assembled on the beach eager to see the explosion.

Fulton wrote a letter to Lord Castlereigh, the next day, which gives a fine account of all that happened. He says:

"Yesterday about four o'clock, I made the intended experiment on the brig, with a carcass of one hundred and seventy pounds of powder; and I have the pleasure to inform you that it succeeded beyond my most sanguine expectations. Exactly in fifteen minutes from the time of drawing the peg and throwing the carcass into the water, the explosion took place. It lifted the brig almost bodily and broke her completely in two. The ends sunk immediately and in one minute nothing was to be seen of her but floating fragments; her main mast was broken in three places; her beams and knees were thrown from her decks and sides, and her deck planks were rent to fibers. In fact, her annihilation was complete, and the effect was most extraordinary. The power, as I had calculated, passed in a right line through her body, that being the line of least resistance, and carried all before it. At the time of her going up, she did not appear to make more resistance than a bag of feathers, and went to pieces like a scattered egg-shell."

The unbelieving statesmen were convinced by this demonstration before their very eyes. Fulton was of course happy and satisfied; and wrote to Benjamin West (whom he affectionately addresses as "Mammy"), giving a graphic account of the event.

DOVER, Oct. 16th, 1805.

MY DEAR MAMMY WEST;

You have perhaps seen in the papers a French account of a little blow-up which took place at Boulogne on the first of this month; it was an experiment on a small scale to try

the effect of four of my submarine bombs or torpedoes. They were carried in by two small boats which the French have magnified to many fire-ships with a formidable attack of boats, etc., which shows that they were much frightened or that the public must be amused with a long story; however, the torpedoes did not produce the desired effect and I saw a great prejudice arise in the minds of the officers against them: but sure of their effects and convinced that they had only been badly applied, I the next day purchased a strong Danish brig of 250 tons, determined to blow her up and at the same time give the officers a lesson how to act: the brig was soon put in order, ballast and water casks were laid in, and sails bent as if intended for a voyage; she was then surveyed and acknowledged on all sides to be as strong as any of the craft at Boulogne: Everything being ready she was on Monday morning sent to Walmar road and anchored opposite Walmar Castle, about half a mile at sea. The public curiosity was soon excited, who expected the experiment to be made about 4 o'clock; but that evening and the next morning passed in practicing my men. About 3 yesterday I came on there and walked down the beach where I made the signal of attack: instantly one of my long galleys rushed forward and grappled the torpedo line in the cable of the tug. The force of the tide then pressed the torpedo, which was set to fifteen minutes, under her bottom, and in fifteen minutes the awful explosion took place: it lifted the whole body of the vessel almost out of water and broke her completely in two in the middle; the mainmast and pumps were blown out of her and in one minute nothing of her was to be seen but floating fragments. The torpedo contained 170 pounds of powder. The experiment was the most complete that could be desired but most

tremendous and frightful and carries with it one reflection which gives me some pain, that in vessels thus attacked it will be impossible to save the men, and many a worthy character must perish.

All doubts are now removed on the power and simplicity of this invention. The defects which have attended it was bad management which is now corrected.

Yours truly,

ROBT. FULTON.

Success was apparently at hand, but again it eluded him. A strong combination of national forces turned the tide of war. Austria and Russia combined forces against Napoleon and the emperor was forced to break camp at Boulogne to transfer the seat of war to Central Europe; nor was this all; on October 21st, less than a week after Fulton's demonstration of torpedo warfare, Nelson with his banner "England expects every Man to do His Duty," won the great victory at Trafalgar, routing the forces of France and Spain, and disposing of any Napoleonic dream of conquest over England on the high seas. Great Britain held supremacy on the ocean, — she needed no new weapon of destruction; and with the artillery of France silenced, the country was unlikely to listen further to Fulton's plan. The old way was considered the best way. Pitt was called "the greatest fool that ever existed, to encourage a mode of war

which they who commanded the seas did not want, and which if successful would deprive them of it."

So faded again Fulton's dream of universal peace through the stratagems of war. Yet he was under contract with the British government to supply the invention, which he found, after many inquiries, they did not want. They offered to grant him an annuity if he would promise to suppress the submarine torpedo and agree that *neither England nor any other country* should adopt it. Fulton sent a fearless reply to the Arbitration Committee who made the suggestion. He declared that he would never consent to the abandonment of his project. "In fact, I will do my utmost to make it a good philosophic work and give it to the world. I will then form a committee of the most respectable men of America and proceed regularly in experiments on a large scale, publishing the result from time to time and thus drawing the attention of the ingenious and enterprising to such pursuits. I shall hope to succeed in my first object, that of annihilating all military marines and giving liberty to the seas."

The English probably smiled contentedly at the ardor of the enthusiast. Fulton continued:

"Gentlemen, a man who has the candor to give you this in writing has but little deception or fear

in his character and will not abandon so glorious an enterprise for trifling rebuffs or mean consideration.

“At all events, whatever may be your reward, I will never consent to let these inventions lie dormant should my country at any time have need of them. Were you to grant me an annuity of twenty thousand pounds a year, I would sacrifice all to the safety and independence of my country. I hope that England and America will understand their mutual interest too well to war with each other. And I have no desire to introduce my engines into practice for the benefit of any other nation.”¹

¹ On the 6th of June, 1914, the writer laid aside work upon this volume, to serve as sponsor for the U. S. Submarine Tender *Fulton*, launched at Quincy, Massachusetts, — the first vessel of its type in our navy, to serve as Mother of the Fleet of Torpedoes.

CHAPTER XII

SOME EARLY STEAMBOATS

FULTON did not forget his promise to build a steamboat for America, even though he was so occupied in trying to induce the English people to use his submarine torpedoes. As soon as he arrived in London, free from the entanglements of French warfare, he renewed his order for the engine and tried to gain permission for its shipment to America.

The permit was finally obtained, the engine built, and in March, 1805, Fulton notes in his account-book that he paid the fee at the Treasury "on receiving permission to ship the engine for America." In January he had paid five hundred and forty-eight pounds for the cylinder and parts of the engine, and in March four hundred and seventy-six pounds, eleven shillings, sixpence for the copper boiler.

Some years ago, a story "went the rounds" of the newspapers that the boiler for Fulton's American boat was made from melted copper pennies.

Coins of 1799 to 1804 were rare and this fiction was invented to explain the scarcity, but Fulton's notebook contradicts it. Copper was hard to get, and expensive, but Fulton found it and paid for it, — full value too, one would say!

The engine preceded Fulton across the water by a year, for Fulton stayed in England until the autumn of 1806. It lay at the Custom House for six months, and was then carted to a storage-house on South Street until the boat was built to receive it.

To this period of Fulton's life belong two interesting letters: they prove that he was ever mindful of his brother and sisters in far-away Pennsylvania, even while he was debating anxiously with English statesmen and planning a novel boat for American waters.

The first letter was written to his brother-in-law, David Morris, and is full of intimate and wholesome advice for he evidently realized the shortcomings in his own early education. Written in London, October 25th, 1805, it says in part:

I wrote you on the 20th and sent you an order on John Mason, Esqr. for 300 dollars to be paid out of my dividends of the first of January 1806, which will make in the whole 900 dollars of which I desired the division as follows:

300 to Mrs. Scott,

300 to Mrs. Cook

200 to Abraham

50 to your wife

50 for sundries, as you will find detailed when you receive my letter.

Having observed bad spelling and writing in the letters I have received, and knowing that such errors may be corrected with a little industry and care on winter evenings, I have desired a friend of mine at New York to send you 4 of Johnston's spelling dictionaries.

4 works on Arithmetic.

4 sets of good copperplate copies of large and small hand.

4 sets of the *Spectator*.

One of each to be a fixture in your family for the use of the children; one of each for Bell's family: one ditto for Mrs. Scott's and one ditto for Abraham.

The dictionaries will, I hope, correct the spelling and by reading the *Spectator* often it will improve the understanding and give ideas of a neat style. It is an immense object to learn children to write a straight fair hand, to spell well and cipher to the rule of three; and although this is not much of an education yet when well fixed in the mind with a little brains and some industry a man may learn anything. The greatest men America has produced had not much more education than here mentioned from their parents, but they had a great and meritorious industry; Franklin, Washington, and Rittenhouse are examples.

Wishing you all well it will give me pleasure to hear that you do well.

ROBERT FULTON.

It is certain that Fulton had practised what he here preaches to his nephews and nieces. During

his study of the great men of the day, Franklin, Washington, and Rittenhouse, he had caught the illuminative spark of their genius, struck out upon life's anvil by their hard blows of untiring work. The secret of their power was constant self-culture, and Fulton applied himself to gain this foundation of strength by the application of his mature mind to the education which circumstances had deprived him of in his youth.

Let us hope that the nephews and nieces gladly received these gift-books from their famous uncle whom they had never seen, welcomed the big dictionaries and arithmetics with joy, and studied hard during the winter evenings, as he suggested.

About the same time he also wrote the following letter to Mr. Hoge, the first settler in Washington, Pennsylvania, from whom he had received an inquiry in regard to the four lots he had purchased. It shows Fulton's unfailing generosity to his brother and sisters :

"I thank you kindly for your friendly letter of the first of June ; it is so many years since I had any communication with you, or accurate account of my relations, together with many copies of my letters being lost in my travels, and considering my property in your country of value only in as much as it was of use to my relatives, I had forgot the

grants I formerly made of the three lots. I find however that one of them has been transferred to Mr. Morris, one to Mrs. Cook, and one was left by my mother to Peggy Scott.

"I now desire that those grants may be considered permanent and resigning all claims to them, from this time I shall not reckon them in my calculations."

In his will, drawn in 1814, Fulton left a legacy of money also to each of his sisters and his brother.

Before we approach the story of the *Clermont*, it is fair and just to give credit to several men who worked very hard to try to build a "first" steamboat. There were so many attempts to produce the needed invention that it is hard to say which man should have the honor of being placed first.

Perhaps the earliest was Dr. John Allen, of England, who in 1730 wrote a scientific paper, entitled "Navigation in a Calm," suggesting that a "fire engine with its furniture" could be put on board a ship and drive it twelve or fourteen miles an hour.

Probably most of those who read his pamphlet smiled at his absurd idea, but six years later, in 1736, Jonathan Hulls took out a patent for a tug-boat to be moved by wheels at the stern by the power of an atmospheric engine.

In America, where there are many deep rivers, it is not surprising to find that there were many experimenters: James Rumsey, of Virginia, built a boat for trial on the Potomac River and in 1787 had it working so well that he journeyed to England to try to advance his invention. There he persuaded a rich American to forward funds to build another boat for a trial on the Thames, but Rumsey died before his vessel was an established success. His system was not very practical and failed to work well.

Captain Samuel Morey, in 1793, built a tiny craft, "scarce big enough to carry himself," it was said, and tried it upon the Connecticut River, but the first attempt failed to establish a claim to consideration and his plan was given up.

In 1792 another Connecticut man, Elijah Ormsbee, a clever carpenter, moved to Providence, Rhode Island, and built a boat in which his friend, David Wilkinson of Pawtucket, fitted "flutter wheels" and a "goose-foot propeller." They made the boat run several times from Pawtucket to Providence, but that was the last heard of it. The piston was turned by atmospheric pressure, not by the direct use of steam.

Nicholas J. Roosevelt, who afterward became Fulton's and Livingston's representative in Ohio

River navigation, also had a "try" at inventing a boat; so had William Henry of Pennsylvania and Edward West; both left records of their attempts.

There were others, too, a long list of worthies, who labored well, but neither well enough nor long enough to convince doubting humanity that they had "found a way upon the waters." Chief among them should forever stand the name of John Fitch, who had so sure yet faint a grasp upon the new science. In 1786, he built a boat thirty-four feet long, and launched it upon the Delaware River where it proved its worth. He organized a stock company to finance and direct the enterprise. The boat ran for a short time between Philadelphia and Bordentown, but the machinery was cumbersome, the service scanty, and the company lost money. In the autumn the boat was set aside and never used again. After a visit to France, where Fitch obtained a patent but failed to secure funds for a new boat, he returned to America as a deck-hand after his fruitless task. A few years later he died, a disappointed and discouraged man. To his mechanical genius there was linked an erratic character and an unsettled disposition. Had he been able to set aside the belittling influences of his life, there is no doubt that he would have been a great man.

As in "Prize Contests" of the present day, *honorable mention* is made of those whose work was excellent although it failed to win the highest award; so may we unhesitatingly yield honorable mention to John Fitch for his years of study. He *did* build a boat; he *did* make it run; but he failed to establish steam navigation as a practical system of transportation and a commercial success.

In addition to these Americans there were men of science in other lands who busied themselves with the same problem. Earl Stanhope of England, whose attempt has been noted; Patrick Miller of Scotland; the Messrs. Hunter and Dickinson; William Symington, who tried a tug on the Forth and Clyde Canal; M. des Blanc, of France, who essayed to build a boat for the Rhone; all are recorded in history as having made honest attempts to prove that the power of steam could be applied to boats. *But how?* That was the question. And it should be noted that Robert Fulton did not accept the theory of any previous experimenter, nor did he merely *happen* upon his successful plan. He worked long and patiently, with varying degrees of success, until he discovered the proper tables of proportion, — the size and shape of the boat and its paddles, the weight and power of the engine, the strength of tide and currents, and all the many

contributing forces which united to form the practical and successful boat he finally produced.

Several interesting descriptions of Fulton's experiments are in existence: one, dated Paris, Jan. 9th, 1803, is entitled "Experiments on the Model of a Boat to be Moved by a Steam Engine." It describes six different methods by which he propelled a model of a boat three feet long and eight inches wide. From the knowledge he gained in these experiments, he compiled a "table of comparisons" showing the different distances covered by the use of varying sized paddles. He concluded: "Propelling a boat through water is the act of separating two bodies,—the boat from its oars or paddles, or whatever else is applied,—and this is governed by laws reducible to simple calculation."

It was this science of calculation which gave Fulton the mastery of the situation, and his title, Inventor of Steam Navigation. He did not build a boat by guess-work, but built many boats by actual calculation of their power and speed; these he introduced upon several waterways and established each as a commercial success. Other men had produced the "flower of invention." Fulton produced the more perfect flower and matured it to actual fruitage.

CHAPTER XIII

BUILDING THE *CLERMONT*

WHEN Fulton, a youth of twenty-one, sailed from America in 1786, he carried one letter of introduction in his pocket and forty guineas in his purse. Twenty years later he returned, a man of prominence, with plans and purposes enough to fill the remainder of his life. His arbitration with the British government was finished; he had been paid for services rendered to the fleet; and the system of torpedo warfare remained his own, for he had declined to suppress it, at any price. He was content, in excellent health, "never better," he said, and in good spirits. Thus he wrote to his friend Joel Barlow, announcing his return.

It was his hope to arrive in America by the 14th of November, his birthday, and eat roast goose in Barlow's hospitable home, "Kalorama," — a fine country estate near the city of Washington. But the slow-sailing ship in which he embarked from Falmouth during the first week in October did not come to port in Halifax, Nova Scotia, until the 13th of December, 1806.

How happy Fulton was to be again in his native land. He traveled at once by stage-coach to visit the Barlows in their new and delightful home, which he called the "Athenian Garden of America." There he entered another circle of Barlow's friends, statesmen of the day, among whom were Jefferson, Madison, and other men of prominence.

In Fulton's letter to Barlow he had said, "You know I cannot exist without a project, or projects, and I have two or three of the first order of sublimity." It was true, and he immediately set himself to the task of forwarding them. He certainly believed in the importance of the work he was about to begin.

The world has honored Fulton as the "inventor of the steamboat"; his history shows that his other invention, the submarine torpedo-boat, was of equal importance in Fulton's estimation. Pledged to partnership with Chancellor Livingston to build the boat for the Hudson River, he also found time, soon after his arrival in America, to interest his countrymen in his project of submarine navigation. Joel Barlow helped him in this plan by inviting James Madison, Secretary of State, and Robert Smith, Secretary of the Navy, to witness an experiment at Kalorama, on the waters of Rock Creek. These men were favorably im-

pressed, and Fulton soon after arranged a series of experiments in the harbor of New York ; but three years went by before Congress appropriated money to finance the invention in a practical way.

Fulton's fame had spread, and in March he was invited by Thomas Jefferson, then President of the United States, to examine the ground and report on the possibility of building a canal to unite the waters of the Mississippi River with Lake Pontchartrain ; but Fulton replied, "although infinitely obliged by the proposal I am sorry I cannot undertake a work so interesting and honorable. The reason is I now have ship-builders, blacksmiths and carpenters occupied at New York in building and executing the machinery of my steamboat and I must return to that city in ten days to direct the work till finished, which will probably require four months. The enterprise is of much importance to me individually and I hope will be of great use in facilitating the navigation of some of our long rivers. Like every enthusiast I have no doubt of success. I therefore work with ardor and when adjusting the parts of the machine I cannot leave the men for a day. I am also preparing the engines for an experiment of blowing up a vessel in the harbor of New York this spring. The machines for this purpose are in great forwardness and I

hope to be able to convince the rational part of the inhabitants of our cities that vessels of war shall never enter our harbors or approach our coasts but by our consent. Thus I hope I am usefully employed for six or nine months."

How strange seem all these plans in the light of a century's progress! We are prone to think that civilization has come by leaps and bounds, but a letter like this proves that men have had to develop it by patient industry.

Fulton engaged a boat-builder, Charles Browne by name, whose yards were at Corlears Hook on the East River, to construct the hull. It was a hundred and fifty feet long, thirteen feet wide, drawing two feet of water, bow and stern sixty degrees. You will remember that the engine from England was safely stored in a warehouse on South Street, and it was carted over to place in the boat on April 23d, 1807. Fulton kept an account of all expenses and his worn little note-book tells many details which otherwise would have been lost.

Plenty of people laughed at the enterprise and few thought it would amount to anything. Idle-minded men crowded near the ship-yards and gave their reasons for predicting the certain failure of *Fulton's Folly*, as they called the boat. This was

unpleasant but Fulton took no notice of them for he had long before realized that only wise people can grasp new ideas. His patience was inexhaustible and his temper undisturbed. He declined to listen to the jeers of the bystanders who often rudely intended their remarks to reach his ears. And day by day the boat advanced toward completion.

It will be remembered that Livingston, by the terms of contract, could not be called upon for more money; we can fancy then how great was Fulton's anxiety when he found that the boat would cost more than he had surmised. It is said that when one thousand dollars were needed to pay the men, Fulton vainly spent an entire evening trying to persuade an intimate friend to lend the money. Nothing daunted, he renewed his entreaties the following day, and finally the friend reluctantly promised a hundred dollars if Fulton could persuade nine others to subscribe the same sum. This he did by promising the subscribers that their names should be kept secret, as they feared ridicule.

The lack of money was exasperating when Fulton felt so sure of his plan, but not an angry or fretful word escaped him; and when work went wrong, as it sometimes did, he commenced again with the same ardor and calmness. Hot weather came on and still Fulton worked hard at the yards,



FULTON MEDAL.

Courtesy of the Century Company.

Struck after the inventor's death in 1815.

superintending every detail; he must often have been exhausted, says Colden, his biographer, but he never complained. He showed himself a moral as well as a mechanical philosopher.

We always think of Fulton's steamboat as voyaging first upon the waters of the Hudson; it is interesting therefore to learn from a letter Fulton wrote to Chancellor Livingston, that the boat was launched in the East River, and there made a successful trial-trip on the 9th of August, 1807, exactly four years after Fulton's demonstration of his French boat on the river Seine. He probably chose the date in remembrance of that never-to-be-forgotten triumph.

The Chancellor was spending the summer at Clermont, his famous country estate on the Hudson River at Tivoli, a short distance below the city of Hudson. His delight must have been great when he received the following letter from his energetic partner. I quote it in full because of its special interest in showing how fully Fulton tested his new craft and how personal was his care and exercise of her movements:

NEW YORK, Monday the 10th August, 1807.

DEAR SIR:

Yesterday about 12 o'clock I put the steamboat in motion, first with a paddle 8 inches broad 3 feet long with which I

ran about one mile up the East River against a tide of almost one mile an hour, it being nearly high water. I then anchored and put in another paddle 8 inches wide 3 feet long, started again and then according to my best observations I went 3 miles an hour, that is two against a tide of one; another board of 8 inches was wanting which had not been prepared. I therefore turned the boat and run down with the tide of one mile, boat 3, equal four, and turned her round neatly into the berth from which I parted. She answers the helm equal to anything that ever was built And I turned her twice in three times her own length.

Much has been proved by this experiment; First, that she will when in complete order run up to my full calculations; Second, that my axles I believe will be sufficiently strong to run the engine to her full power; Third, that she steers well and can be turned with ease. The sum of the surfaces of the paddles were 8 feet, the Bow of the boat 9. My paddle boards should have been equal 12 feet which I was afraid to put on at first; they are now making.

The engine having worked for the first time requires overhauling and new packing. The cold-water pump for condensing is 7 inches and a two foot stroke yet does not furnish sufficient cold water for complete condensation and vacuum. I am about making it 10 inches diameter; these connections with the finishing of the cabins will take me the entire week and I shall start on Monday next at 4 miles an hour.

Yesterday I beat all the sloops that were endeavoring to stem tide with the slight breeze which they had; had I hoisted my sails I consequently should have had all their means added to my own.

Whatever may be the fate of steamboats for the Hudson

every thing is completely proved for the Mississippi, and the object is immense. Please to forward me 1000 or 1500 dollars as soon as possible.

Yours truly,

R. FULTON.

Best respects to Mrs. Livingston.

Addressed to Robt. R. Livingston, Esqr.

Clermont,

New York.

Money was again needed, you see, but we may be sure it was forthcoming with this proof of the success of the great project. For the trial-trip, although it made necessary some slight alterations, removed all doubt as to its power. During the week the boat was moved to its new dock on the North, or Hudson River, and the carpenters were set at work to finish the cabins and make the boat ready for her first official voyage up the Hudson. Fulton promised the Chancellor that it should take place "on Monday next," — that was August 17th, — so Fulton's partner and several members of his family journeyed to New York, by sloop or stage-coach, to take the historic trip.

CHAPTER XIV

FIRST VOYAGE OF THE *CLERMONT*

THE eventful day, the 17th of August, 1807, dawned with blue, unclouded skies. There was a buzz of excitement throughout the morning as the guests, about forty in number, assembled at the dock near the old States Prison, in Greenwich Village.

Miss Helen Livingston, a young lady who was present, had written her mother, "Cousin Chancellor has a wonderful new boat which is to make the voyage up the Hudson some day soon. It will hold a good many passengers and he has, with his usual kindness, invited us to be of the party. He says it will be something to remember all our lives. He says we need not trouble ourselves about provisions, as his men will see to all that."

She with her sister, Kate Livingston, made the famous trip and many years later told its story to her granddaughter, Helen Evertsen Smith, who wrote it out. "Cousin Chancellor" predicted the truth when he said it would be something to remember all their lives! There were several ladies

in the party, as well as the Dean of Ripon Cathedral, England, John R. Livingston, and other persons of distinction. Some were incredulous and all were slightly uneasy. Fulton himself has thus described the exciting time :

The moment arrived in which the word was to be given for the boat to move. My friends were in groups on the deck. There was anxiety mixed with fear among them. They were silent, sad and weary. I read in their looks nothing but disaster and almost repented of my efforts. The signal was given and the boat moved on a short distance and then stopped and became immovable. To the silence of the preceding moment, now succeeded murmurs of discontent and agitation, and whispers and shrugs. I could hear distinctly repeated 'I told you so; it is a foolish scheme: I wish we were well out of it.'

I elevated myself upon a platform and addressed the assembly. I stated that I knew not what was the matter, but if they would be quiet and indulge me for half an hour I would either go on or abandon the voyage for that time. This short respite was conceded without objection. I went below and examined the machinery and discovered that the cause was a slight maladjustment of some of the work. In a short time it was obviated. The boat was again put in motion. She continued to move on. All were still incredulous: none seemed willing to trust the evidence of their own senses. We left the fair city of New York: we passed through the romantic and ever-varying scenery of the Highlands; — we descried the clustering houses of Albany: we reached its shores, — and then, even then, when all seemed achieved, I was the victim of disappointment.

Imagination superseded the influence of fact. It was then doubted if it could be done again, or if done if it could be made of any great value.

We must not imagine that the boat was as perfect as the modern steamboats of to-day. Far from it! She was a strange looking vessel; the uncovered machinery occupied the center and groaned and creaked from time to time. The huge paddle-wheels splashed in and out of the water, casting spray on the decks and high in the air. The rear cabin was set aside for the use of the ladies, — the forward cabin for the men. There were two tall masts, provided with sails in case of need. A rude compass on deck guided the pilot in steering the boat. All together it is not to be wondered at that the odd-looking boat, spitting forth steam and splashing water at both sides, excited the lively interest of all who could see the vessel from both shores of the river.

It is said that the boat had not long been under way when Fulton caused it to be stopped because he saw a way of improving the paddles. He lessened their diameter, so the buckets took less hold of the water, for certainly they splashed too much. When the boat started again it was found that the alteration had increased her speed. It is said that her first performance exceeded the expec-

tation of the passengers on board, and none but Fulton thought that she could be improved.

But after this adjustment there was no further trouble. The wheels went around with regular stroke as the boat advanced steadily up the river and convinced the skeptical that Fulton had fulfilled his promise.

One of the newspapers, the *American Citizen*, printed this notice that morning :

“Mr. Fulton’s ingenious steamboat, invented with a view to the navigation of the Mississippi from New Orleans upward, sails to-day from the North River, near States Prison, to Albany. The velocity is calculated at four miles an hour. It is said it will make a progress of two against the current of the Mississippi and if so it will certainly be a very valuable acquisition to the commerce of Western states.”

This news, together with the popular interest aroused near the dockyards, brought a crowd of people to the shores. During the setting-forth from the dock, the jeers of many could be plainly heard. As the paddles began to turn and the boat swung about to position and headed up stream, the faces of the doubters changed as though by magic. *Fulton’s Folly* was not merely afloat, it was moving with majesty and with assurance. The

scoffs subsided, exclamations of wonder took their place; then, as the triumph of the experiment became evident, a cheer arose from the shore. It was echoed and repeated until the entire crowd acknowledged its mistake in a wild tumult of cheers, — the first public acclaim to greet the new invention.

From Helen Livingston's letter we know that refreshments were provided for the party; and there were couches in the cabins upon which the guests could sleep at night, for the voyage to Albany took thirty-two hours instead of nine, as at the present day.

The boat splashed on its way, looking it is said "like a backwoods saw-mill mounted on a scow and set on fire." Wood was used for fuel and when the fireman stirred the flames they shot high in the air, throwing out a multitude of sparks as well, which must have looked terrifying enough to the people on shore, especially in the darkness of the night. The sailors on the river sloops were amazed as they saw this queer boat gaining upon them, while some of the more timid actually ran their boats to shore and took to the woods in fright. Others gathered on the river bank and prayed for protection against this "monster" made by man. All were spellbound with astonishment and passed

the word from one to another, so that the dwellers from all the houses near shore ran forth to view the strange craft.

After the first fear had passed, happiness prevailed on board. The quiet ease of Fulton's and Livingston's manner, as they moved about among their guests, restored peace of mind. By night, when filmy shadows fell over the mountain tops and the setting sun touched the waters with gold, the guests were thrilled with delight. The presence of the ladies added a touch of beauty to the strange-looking vessel, and as they proceeded through the picturesque Highlands, the party sang the melodies of the day. The Scotch ballad said to have been a favorite of Fulton's rang out :

“Ye banks and braes o’ Bonny Doon,
How can ye bloom sae fresh and fair?
How can ye chant, ye little birds,
And I sae weary fu’ o’ care?”

But Fulton's care, for the time, had sped away. He was surrounded by friends whose compliments upon his success must have been both welcome and pleasant. Helen Livingston's granddaughter writes: “There were many distinguished and fine-looking men on board the *Clermont*, but my grandmother always described Robert Fulton as surpassing them all. ‘That son of a Pennsylvania

farmer,' she was wont to say, 'was really a prince among men. He was as modest as he was great and as handsome as he was modest. His eyes were glorious with love and genius.'"

A great personal happiness filled Fulton's thought, beyond that of his success in the invention, for on the second day of the voyage, as the boat was about to cast anchor at the Clermont dock of the Chancellor, the latter, as a crowning touch of romance to the triumph of the voyage, announced the betrothal of his fair young cousin, Miss Harriet Livingston, to the inventor. In easy, graceful words he added that the name of Robert Fulton would descend to posterity as a benefactor to the world, for it was not impossible that, before the end of the century, vessels propelled by steam alone might make the voyage to Europe! The guests were too polite to laugh at this suggestion in the presence of the Chancellor and the inventor but, after several of the company had indulged in hidden smiles, John R. Livingston whispered to his cousin, "Bob has had many a bee in his bonnet before now, but this steam folly will prove the worst yet!"

It has been reported that the consent of the Livingston family had been withheld from Fulton's engagement until he could prove his invention a success. He had asked the Chancellor if he might

aspire to the hand of his fair cousin and had received the reply: "Her father may object . . . but if Harriet does not object,—and she seems to have a world of good sense,—go ahead, and my best wishes and blessings go with you."

In the light of later events, it is hard to see why any objection could have been raised. Fulton, then forty-two years old, had made his way against great odds, and was a prominent man on both sides of the Atlantic. Harriet Livingston, a guest of honor on the historic trip up the Hudson, was the daughter of the Hon. Walter Livingston, Commissioner of the United States Treasury. The bride-elect had inherited beauty and talent. She played upon the harp and also sketched in pencil with delicacy and skill, an accomplishment which naturally appealed to Fulton's artistic taste.

Her father, Walter Livingston, son of the last Lord of the Manor of Livingston, had inherited as his share of the vast grant of land of 1715, which comprised over 160,000 acres, a tract of 28,000 acres, which he named "Tiviotdale." Upon this great estate he had built an imposing mansion to which in later years Fulton and his wife paid many visits.

The party left the boat at Clermont, while Fulton and the Chancellor, after spending the night

at the latter's hospitable home, continued the journey to Albany, arriving there at five o'clock in the afternoon. When the voyage to New York was made, Fulton set about improving his boat that she might be more comfortable for the many passengers he hoped to carry up and down the river. He wrote to Barlow, as follows:

"My steamboat voyage to Albany and back has turned out rather more favorably than I had calculated. The distance from New York to Albany is one hundred and fifty miles. I ran it up in thirty-two hours and down in thirty. I had a light breeze against me the whole way, both going and coming, and the voyage has been performed wholly by the power of the steam engine. I overtook many sloops and schooners beating to the windward and parted with them as if they had been at anchor. The power of propelling boats by steam is now fully proved. The morning I left New York there were not perhaps thirty persons in the city who believed that the boat would ever move one mile an hour, or be of the least utility, and while we were putting off from the wharf, which was crowded with spectators, I heard a number of sarcastic remarks. This is the way in which ignorant men compliment what they call philosophers and projectors. Having employed much time, money and zeal in

accomplishing this work, it gives me, as it will you, great pleasure to see it fully answer my expectations. It will give a cheap and quick conveyance to the merchandise on the Mississippi, Missouri and other great rivers, which are now laying open their treasures to the enterprise of our countrymen ; and although the prospect of personal emolument has been some inducement to me, yet I feel infinitely more pleasure in reflecting on the immense advantage my country will derive from the invention."

And so was *Fulton's Folly* changed to *Fulton's Triumph*! There are several accounts of the return voyage, notably one written by a Frenchman, Monsieur Michaux, a distinguished botanist, who happened to be in Albany at the opportune time when Fulton's boat was about to make its return voyage down the Hudson. He with his companion, a man named Parmentier, had been three days in the capital city when they read in the paper about the arrival of a "steam boat" from New York, commanded by the inventor, Robert Fulton. Crowds of people were flocking to the dock to see the strange craft. Some admitted that a great advantage might be gained by the novel method of transportation, although many persons predicted that the boiler would explode and cause serious accidents.

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A sign hung upon the side of the boat announced that it would start for New York on Wednesday, August 20th, and would carry passengers at the same price charged by sailing-masters on their sloops, seven dollars.

The two Frenchmen decided to try the experiment. They were alone in their decision, all other travelers preferring to go by the old "slow and sure" way. The boat set off in sight of a crowd of spectators which had gathered at the dock. The smoke from the engine could be seen for some distance throwing a black column to the sky, and many persons gathered on near-by hillsides to wave their handkerchiefs and hurrah for Fulton whom they noticed in command when the boat came up the river.

Monsieur Michaux said that when they paid Mr. Fulton their fare, before they left the boat, he commented on the courage of two Frenchmen to embark when so many of his countrymen declined to try the experiment. It is interesting to remember that Fulton carried passengers from both France and England, the two countries where his preliminary attempts had been worked out; for an Englishman, probably the Dean of Ripon Cathedral, who is known to have been a guest of the Chancellor on the first trip of the *Clermont*, wrote a

letter which was printed in the *Naval Chronicle*, for 1808, Vol. XIX, page 188 :

“I have now the pleasure to state to you the particulars of a late excursion to Albany in the steamboat, made and completed under the directions of the Hon. Robert R. Livingston and Mr. Fulton, together with my remarks thereon. On the morning of the 19th of August Edward P. Livingston, Esq. and myself were honoured with an invitation from the Chancellor and Mr. Fulton to proceed with them to Albany, in trying the first experiment up the river Hudson, in the steamboat. She was then lying off Clermont, the country seat of the Chancellor, where she had arrived in twenty-four hours from New York, being 110 miles. Precisely at thirteen minutes past nine o'clock A.M. the engine was put in motion, when we made a head against the ebb tide and the head wind blowing a pleasant breeze. We continued our course for about eight miles, when we took the flood, the wind still ahead. We arrived at Albany about five o'clock P.M. being a distance from Clermont of forty-five miles, (as agreed by those best acquainted with the river) which was performed in eight hours, without any accident or interruption whatever. This decidedly gave the boat upwards of five miles an hour, the tide sometimes against us, neither the

sails nor any implement but the steam used. The next morning we left Albany at twenty-five minutes past nine and arrived at Clermont in nine hours precisely, which gave us five miles an hour. The current on returning was stronger than when going up. After landing us at Clermont, Mr. Fulton proceeded with the passengers to New York. The excursion to Albany was very pleasant and presented a most interesting spectacle. As we passed the farms on the borders of the river, every eye was intent, and from village to village the heights and conspicuous places were occupied by the sentinels of curiosity, not viewing a thing they could possibly anticipate any idea of, but conjecturing about the possibility of the motion. As we passed and repassed the towns of Athens and Hudson we were politely saluted by the inhabitants and by several vessels, and at Albany we were visited by his Excellency, the Governor, and many citizens. She is unquestionably the most pleasant boat I ever went in. In her the mind is free from suspense. Perpetual motion authorizes you to calculate on a certain time to land; her works move with all the facility of a clock; and the noise when on board is not greater than that of a vessel sailing with a good breeze."

And so the journey to Albany and back was

complete, the triumph assured. That tiny steam-boat, with splashing side-paddles, had been acknowledged a safe transport. With great pleasure the captain, Andrew Brink by name, who certainly knew more of navigation than of spelling French names, wrote in his note-book :

List of passengers on board the North River Steamboat from Albany to New York, August 21, 1807 :

	Dollars
Captain Thomas Hunt	7
Monsieur Parmentoo	
Monsieur Mishaud	13
Mr. E. D. Tyle	6
Captain Davies	<u>1</u>
	27
Mr. Fulton	

Captain Brink had previously had command of the river sloop *Maria*. When Fulton and Livingston journeyed on his sloop to Clermont they discussed the plan for the steamboat, and finding Brink intelligent and interested, they promised to employ him upon the new ship. On September 20th, 1807, Fulton entered his month's pay-roll in his account book :

To Captain Brink	30 dollars
George, the Steward	10 "
Paid Griffin, the Black Steward,	12 "
Paid Richard Wilson, the Black Cook,	10 "

Captain Brink lived on the west bank of the Hudson, opposite Clermont. After he had landed his passengers at the Chancellor's dock, on the voyage up the river, he borrowed a rowboat, crossed the river, and brought his wife back to take the remainder of the trip, for he had promised "to take her to Albany on the boat driven by a tea-kettle."

The chief engineer was a Scotchman who had to be discharged, for at Albany he went ashore and indulged too freely in drink as a celebration of the successful voyage. Fulton promoted Charles Dyke, assistant engineer, to his place, and he did so well that he remained for many years in Fulton's employ, and in time became chief engineer of the first ferry-boat used at Fulton Ferry.

So Fulton proved himself not merely a master of mechanics, but also of management and administration of the new method of travel. He not only began well but continued wisely.

After Fulton reached New York he took time to write a letter to the one newspaper, the *American Citizen*, which had noted the departure of his boat. It was well that he did so, for this furnishes an historical record of the achievement. It is a simple and straightforward account of the voyage, with no extravagant predictions as to the future.

NEW YORK, August 20th, 1807.

TO THE EDITOR OF THE *American Citizen*,

SIR;

I arrived this afternoon at 4 o'clock on the steamboat from Albany. As the success of my experiment gives me great hope that such boats may be rendered of much importance to my country, to prevent erroneous opinions and to give some satisfaction to the friends of useful improvements, you will have the goodness to publish the following statement of facts:

I left New York on Monday at 1 o'clock and arrived at Clermont, the seat of Chancellor Livingston, at 1 o'clock on Tuesday, time 24 hours, distance 110 miles: On Wednesday I departed from the Chancellor's at 9 in the morning and arrived at Albany at 5 in the afternoon, distance 40 miles, time 8 hours: the sum of this is 150 miles in 32 hours, equal near 5 miles an hour.

On Thursday at 9 o'clock in the morning I left Albany and arrived at the Chancellor's at 6 in the evening: I started from thence at 7, and arrived at New York on Friday at 4 in the afternoon; time 30 hours, space run through, 150 miles, equal 5 miles an hour. Throughout the whole way my going and returning the wind was ahead; no advantage could be drawn from my sails — the whole has therefore been performed by the power of the steam engine.

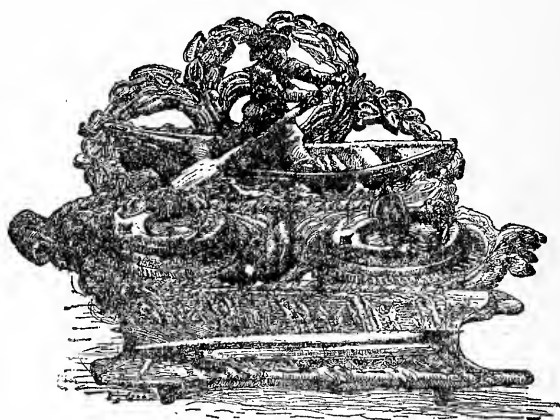
I am, Sir,

Your Most Obedient,

ROBERT FULTON.

Friends were ready enough now to congratulate the inventor upon his success, but he had scant

time to listen, for his first accomplishment made further work necessary. He plunged at once into hard work for the development of his plan which included steam navigation for the inland waters of America.



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FULTON'S INKSTAND

CHAPTER XV

STEAMBOATS AND SUBMARINES

Now that Fulton had attained his heart's desire, — the great plan for steam navigation, — there was no time to rest upon his laurels. One success is but a key to future opportunity. He reasoned well that the Hudson had provided only the opening chapter, as it were, to a great volume of possible attainments. Every river in the world offered an equal avenue for the march of progress in transportation.

That first voyage of the *Clermont* revealed many slight imperfections which Fulton's fertile brain immediately remedied in imagination. He laid the vessel up in dock at New York for two weeks that he might add to her equipment and improve the conditions on board for the comfort of the passengers. He boarded the sides, decked over the boiler, furnished each cabin, fore and aft, with twelve berths, and strengthened the ironwork in many parts. He also had the boat thoroughly calked, and as much rain fell during the time, the

work was delayed. Fulton described these improvements in a letter to the Chancellor, and joyously wrote, "The boat will be as complete as she can be made — all strong and in good order and the men well organized; and I hope nothing to do but to run her for six weeks or two months, — I will have her registered and everything done which I can recollect. Everything looks well and I have no doubt will be very productive."

On September 2d, Fulton advertised in the *New York Evening Post* as follows: "The North River Steam Boat Will leave Pauler's Hook on Friday, the 4th of September, at 6 in the morning, and arrive at Albany, on Saturday, at 6 in the afternoon. Provisions, good berths, and accommodations are provided."

An announcement of rates followed; three dollars to Newburgh, and seven to Albany, with suitable prices for intermediate stations; the rate of travel was fourteen hours to Newburgh and thirty-six to Albany. It was stated that the boat would leave Albany twice and New York once during the succeeding week, after which further schedules would be published.

This time-table was duly carried out; bright and early, at half past six, on a clear September morning, the fourteen passengers brave enough to

venture started on their northward trip. When they arrived, they found Fulton already on board, his actions confident and decided, unheeding the fear of some and the sarcasm of others. His clear tones could be heard above the hum of the voices of the multitude — which had gathered to watch the departure — and the noise made by the escaping steam which leaked from several valves. So we learn from Judge John Q. Wilson, of Albany, one of the fourteen who dared to make the voyage though warned by a prudent Quaker friend: “Wilt thou risk thy life in such a concern? I tell thee she is the most fearful wild fowl living and thy father ought to restrain thee.”

But though a predicted failure, the voyage proved so pleasant an experience that the passengers drew up a statement to record their satisfaction. Gerrit H. Van Wagenen served as time-keeper and Judge Wilson drafted the testimonial which, signed by the entire company, was published in the *Albany Register* of September 8th.

From Verplanck's Point to Wappinger's Creek the wind was favorable but light: after that it was ahead or calm, yet they made the full distance of 150 miles in 28 hours and 45 minutes. Judge Wilson wrote: “The subscribers, passengers on board of this boat on her first passage as a packet,

think it but justice to state that the accommodations and conveniences on board exceeded their most sanguine expectations."

They had an amusing experience at Haverstraw Bay. As the boat steamed along, a man in a skiff lay in wait. His appearance showed him to be a miller, for his hair and clothing were covered with flour. He had evidently dashed forth from his mill on the riverside when he saw the queer boat approaching, had boarded his skiff and rowed out into the stream for a conversation with the captain. He signaled that he would like to come on board, so Fulton ordered that a rope be thrown him to draw his skiff alongside the *Clermont*. He called out that he "did not know a mill could go up-stream, so he came to enquire about it." One of the passengers, Dennis Doyle, an Irishman who loved a good joke, offered to guide him all over "the mill." The miller climbed on board, and Dennis showed him all the wheels and machinery and told him in fun that by a simple contrivance one wheel could be thrown out of gear when the mill was to go up-stream. "But show me the grindstones," said the miller. Dennis kept a straight face and pointing to Fulton answered, "That is a secret which the master has not yet told us: when we come back from Albany with our

load of corn, if you come on board then, you will see the meal fly." The simple-minded miller rowed back to the shore, wondering whether he could really move his own mill up-stream in the same fashion.

At West Point the whole garrison was on the river bank to cheer the boat, while at Newburgh it seemed as though the entire population of Orange County had assembled; the hillside city was all alert. The ferry, a sail-boat from Fishkill, was crowded by a party of ladies, and the captain tacked close to the steamboat, which had just landed a passenger at the dock. The flapping of the near-by sail attracted Fulton's attention and he raised his eyes to meet a flutter of handkerchiefs and a group of smiling, happy faces. He hurriedly raised his hat in acknowledgment as he gallantly exclaimed, "That is the finest sight we have seen yet!"

The passengers' statement in the newspaper was a fine advertisement for the new mode of travel and by October the *Clermont* was well established as a passenger carrier.

Fulton wrote a letter to Captain Brink, on October 9th, which showed a good master of the new enterprise. He expected every man in his employ to do his duty, — there was to be no half-way service.

It gives an insight into Fulton's strength of character and reveals an important factor in his success :

CAPT. BRINK;
SIR;

NEW YORK, Oct. 9th, 1807.

Inclosed is the number of voyages which is intended the Boat should run this season. You may have them published in the Albany papers.

As she is strongly manned and everyone except Jackson under your command, you must insist on each one doing his duty or turn him on shore and put another in his place. Everything must be kept in order, everything in its place, and all parts of the Boat scoured and clean. It is not sufficient to tell men to do a thing, but stand over them and make them do it. One pair of Quick and good eyes is worth six pair of hands in a commander. If the Boat is dirty and out of order the fault shall be yours. Let no man be Idle when there is the least thing to do, and make them move quick.

Run no risques of any kind when you meet or overtake vessels beating or crossing your way, always run under their stern if there be the least doubt that you cannot clear their head by 50 yards or more. Give in the accounts of Receipts and expenses every week to the Chancellor.

Your most obedient,
ROBT. FULTON.

Captain Brink continued in charge of the *Clermont* during the season of 1807 and was succeeded the following spring by Captain Samuel Wiswall who was employed by Fulton for many years. The

boat ran well, with only one accident, when, on November 13th, a cast-iron axletree broke, as the *Clermont* was setting out from New York and she was obliged to return for repairs. By this time the weather was cool and ice was forming in the river. On the 20th of November Fulton wrote to the Chancellor, — "It is now time to lay her up for the winter. Nothing should be risked from bad weather — the gain will be trifling, the risque great." He adds another warning in postscript: "Do not risque the engine in the winds and waves of the season." He also outlined the changes and enlargements he planned to make in the boat during the winter.

Through the cold weather she was laid up at the north end of the Hudson and underwent extensive repairs and alterations. An interesting letter written by Francis Sayre, of Catskill, describes the changes and gives so many interesting facts that it is here printed. He writes under date of September, 1857:

"I am as far as I know the only person now living who was on board the first steamboat on her trial trip from New York to Albany. I do not refer to the trial trip which was made in 1807, but to the first trip made by the old *North River*, the first passenger boat propelled by steam.

“The craft employed by Mr. Fulton on the trial trip (called the *Clermont*, but probably never registered) was taken to what was then called Lower Red Hook and in the winter of 1807 and 1808 was hauled on ways to be enlarged and converted into a commodious steamboat. The alterations and enlargement were made by ship-builders of the city of Hudson during the winter and spring. She was launched about the first of May and called the *North River*. She was taken down to New York by Captain Samuel Jenkins, who had her in temporary charge, until Captain (afterward styled Commodore) Wiswall should be able to assume command. On arriving at New York she was taken to the dock at the foot of Dey Street (then far up town) where the machinery was put on board, and the cabin and carpenter’s work were completed. This was done with a rapidity which in those days was considered extraordinary, Mr. Fulton himself overseeing and attending to every part. He was usually on board as early as five o’clock in the morning and would be there almost the entire day. I never knew a more industrious, indefatigable, laborious man. Fulton’s new steamboat was the wonder of the day. She was visited daily by hundreds of the curious who asked many queer questions in relation to the operation of the steam and

machinery; one of these almost invariably was, 'Where and how was the steam to be conveyed to the waterwheel?' The crowd of visitors became in time a great annoyance and hindrance to the workers on board and I recollect a very amusing incident connected with the attempt to prevent intrusion. Mr. Fulton directed a painter to letter a board with the words:

ONE DOLLAR FOR ANY PERSON TO COME ON BOARD
WITHOUT LIBERTY

which was put up in a conspicuous place.

"One day a sailor came along and read the notice. Jack was not long in putting his construction upon it, and with a knowing wink of the eye, jumped on board without ceremony, pointed to the sign, and accosted the man nearest him with, 'Mister, who pays me that dollar?'

"Mr. Fulton was standing near and laughed heartily, a thing unusual for him, for while among the workmen he was generally rather taciturn and grave, giving his orders and directions in a laconic manner. He would listen, however, to suggestions made by the more practical, and would often modify his orders to accord with such suggestions. During the time these preparations were going forward, trials were made of the working of

the machinery by hauling out into the stream, putting on steam, and starting the engine. This was no small affair, for when the engineer gave the notice, 'All ready,' all hands were called, — carpenters, joiners, painters, calkers, laborers and crew, — to prevent what is termed 'catching on the center.' During one of these trials, when going up the river at the rate of six or eight miles an hour, Mr. Fulton stood looking over the bow of the boat for fifteen or twenty minutes, intently watching the motion and speed of the boat, apparently wholly absorbed. Suddenly he wheeled and addressed a friend who stood near him with great enthusiasm, exclaiming, 'My good friend, she is a fine boat and our success is certain.'

"Commodore Wiswall was now in command. At the hour appointed, 9 A.M., for her departure for Albany, Chancellor Livingston with a number of invited friends came on board and, after a good deal of bustle and no little noise and confusion, the boat was got into the stream and headed up the river. Steam was put on and sails were set, for she was provided with large square sails attached to masts that were so constructed that they could be raised or lowered as the direction and strength of wind might require. There was at the time a light breeze from the south, and with steam and

sails a very satisfactory rate of speed was attained. Fast-sailing sloops were passed with ease, the machinery worked finely and everything seemed to promise well. After a time, however, it was discovered that steam was escaping from the boiler. This boiler was constructed of wood, a cylinder perhaps twenty feet long and ten in diameter, bound with heavy iron bands, with iron tubes extending from the lower part of the furnace. The heat imparted to the iron bands by the steam produced a shrinking of the wood directly under them, while the spaces between them would swell with moisture imparted by the steam so that the edges of the planks would be uneven, leaving open spaces through which the steam escaped. How could the difficulty be obviated? Resort was had to covering the boiler with blankets and carpets which, to some extent, prevented this evil and, as the favorable wind continued, we kept on the even tenor of our way and just before sunrise next morning we were at Clermont, the residence of the Chancellor, who with his friends landed, and the boat proceeded to Albany, where we arrived at 2 or 3 P.M."

When the boat reached New York, on the return trip, Fulton immediately had a copper boiler made to replace that of wood which had caused the

trouble. He was very energetic and ready to take any trouble or incur any expense necessary to perfect the boat.

As soon as the *North River of Clermont*, as she was enrolled May 14th, 1808, was completed to Fulton's satisfaction, he began to build a companion boat, thereby establishing a service from each port twice a week. This boat, the *Car of Neptune*, was followed by a third, the *Paragon*. The last was, of course, the best, for Fulton improved each model by noting the imperfections of its predecessor. He humorously wrote, in a private letter, of 1812, "My *Paragon* beats everything on this globe, for made as you and I are, we cannot tell what is in the moon — this Day she came on From Albany 150 miles in 26 hours wind ahead." ¹

But during these years, busy as they were, Fulton had not forgotten his dream of universal peace through the work of his other invention,—the

¹ Extract from letter from Robert Fulton to Benjamin West, March 23, 1809:

"My Steamboats are doing wonders, the one of last year cleared 16,000 dollars. I am now building two more; when finished there will be two running between New York and Albany and one between New York and New Brunswick in Jersey on the route to Philadelphia. There is a fair calculation that these Boats will clear 25,000 dollars a year, of which I have half so that I am doing very well."

submarine torpedo-boat. You will remember that when Fulton reached America he laid his plans before Mr. Madison, Secretary of State, and Mr. Smith, Secretary of the Navy. These gentlemen were so impressed that they influenced the government to grant some money for an experiment in the harbor of New York. In the spring of 1807, to prepare the minds of the citizens for the new invention, Fulton invited the mayor and other gentlemen to Governor's Island, where he showed them his machines and the copper cylinders for his torpedoes.

In time the meeting developed a humorous aspect. The spectators became so interested that they crowded eagerly around him as he explained, "Gentlemen, I have here a charged torpedo with which, precisely in its present state, I mean to blow up a vessel. It contains one hundred and seventy-five pounds of gunpowder, and if I were to allow the clockwork to run for fifteen minutes, I have no doubt that it would blow this fortification to atoms." His listeners first looked at each other aghast, then the more prudent hastily stepped back, and one by one the others slipped away until Mr. Fulton found himself alone, with only two or three of the bravest of his auditors peering at him from under a distant gateway! None dared to

return until he placed the deadly torpedo back in its place in the magazine.

On the 20th of July he blew up a large brig in the harbor of New York, and described this experiment with others in his book, "Torpedo War or Submarine Explosions." After three attempts the vessel was blown to atoms, only a column of water, smoke and fragments being left to show where she had been floating. The next day Fulton wrote a letter to the governor and magistrates of the city in which he said :

"Gunpowder, within the last three hundred years, has totally changed the art of war ; and all my reflections have led me to believe that this application of it will in a few years put a stop to maritime wars, give that liberty on the seas which has been long and anxiously desired by every good man, and secure to America that liberty of commerce, tranquility, and independence which will enable her citizens to apply their mental and corporal faculties to useful and humane pursuits, to the improvement of our country, and the happiness of the whole people."

So did Fulton dream of peace,— a dream still unfulfilled, yet worthy of our future hope.

In 1810 Congress appointed a committee to decide upon the worth of Fulton's submarine war-

fare, and Commodore John Rodgers was told to do all he could to get the sloop *Argus* ready to resist the attack Fulton was to make upon her. Commodore Rodgers entered the contest with the enthusiasm of a boy. He had a strong wire netting stretched around the bottom of the boat and anchored lashed spars to float at her sides; while grappling irons, hung far out from the rigging, were ready to plunge at any boat approaching with hostile intent. Huge scythes were hinged to her decks, ready to cut off the heads of any sailors who ventured within reach. It takes an American to beat an American! Fulton confessed that, for the time, he had been outwitted but promised the officers of the navy that he would yet find a way to conquer the difficulties.

His method is described in a letter to his old friend Joel Barlow; it says in part:

"I have had some trouble with the torpedo experiments in consequence of the determined opposition of the officers of the navy, for which I now thank them. They had placed splinter nets across the bow of the vessel with weights which held them to the ground; booms were floated in the water and spaced out 20 feet from her sides to guard her sides. Grappling oars with sword blades and ballast in slings, to show how they could sink my

boats, made a formidable appearance against one poor torpedo boat and eight poor men. Moreover, all this would not have saved them had the nets not been to the ground; I was not prepared for nets thus arranged. Hence the committee gave me till the 29th of this month to show how I would get through the nets or carry them away. I am now prepared to prove that nets and booms are no better protection than cobwebs. Commodore Rodgers opposes me with much ardor and ingenuity; the reason he says I cannot do it is that I have not practical nautical knowledge; this might be true but reflection for the last 113 days has given me knowledge to the same effect, so that with a log-ship of about two hundred tons burden arranged with torpedoes and without cannon, I will destroy any ship that ever was built, that is, if she dare to lay at anchor, or if in fact she does not run away faster than I can run to overtake her; this fortunately can be done in port, along our coast, or in open sea: I have just finished a model of this log torpedo ship, also a bullet-proof torpedo boat that acts without oars, — thus you see I am on the highroad to success and in good spirits.”

But although Fulton's system was not then adopted, he had gained the recognition of the United States Navy, and had presented the germ

for expansion in other minds for submarine warfare, now practiced by navies throughout the world. Moreover, he had the honor of building, in 1814, the first steam war-ship, the *Demologus*, meaning "The Voice of the People," later named *Fulton*.

This alone gives the inventor high honor, for in time it changed all the navies of the world. Our country has recognized Fulton's patriotism by naming its first submarine tender to burn oil in her engines, the *Fulton* (1914), and has retained his name "torpedo" for all its submarine craft.

CHAPTER XVI

FERRY-BOATS AND RIVER-BOATS

THE few remaining years in Robert Fulton's life were very busy ones. In 1809 he formed a stock company to finance the building of steam ferries to run from New York to Jersey City, and so thoroughly was Fulton trusted that the entire construction of the new boats was left solely to him. Before this time there had been rowboat and sail-boat ferries, and a "horse-boat," propelled by paddles which were turned by the feet of four blind horses walking a tread-mill.

We can imagine how welcome were Fulton's steam ferries. He called them "twin-boats" because he built each boat with two complete hulls, connected by a bridge or deck, which provided a wide platform for carriages and passengers. The ends were rounded, just as they are in present-day ferries, so that the boats could cross and re-cross the river without turning; and floating docks were built to receive them, also "fenders," to avoid any shock from collision when the boats came to shore.

It has been said that if steam navigation had been applied to no other purpose than to move these "floating bridges," over streams where no other bridge could be built, he who applied it would deserve to rank among the great benefactors of mankind.

Fulton called his first ferry-boats *York* and *Jersey*, and the one he built in 1812 for the East River was named *Nassau*. As traffic increased between the New York terminals a new street was opened between the ferries, in 1816-18, and was appropriately named Fulton Street. The ferry over the East River, where thousands of persons daily crossed to Brooklyn and other points on Long Island, also honored the inventor, and was called "Fulton Ferry."

These busy years of Fulton's life were harassed by lawsuits over patent rights; for as soon as steam navigation was proved a success, certain unscrupulous speculators rushed in to try to make money by the new invention. Fulton called them "mental pirates" because they tried to steal the riches of his mind, and in many cases they succeeded in making more money from the invention than Fulton himself ever gained.

You may remember that during his stay in France Fulton had been impressed by the splendid

possibilities of opening navigation on the great Mississippi River. This idea came to him when the United States purchased Louisiana. As soon as the *Clermont* was established as a passenger boat on the Hudson River, the partners, Livingston and Fulton, decided to engage the services of a third person who was interested in steam navigation, namely, Nicholas J. Roosevelt, a personal friend of both men and an experimenter, as early as 1781, with an original, although since abandoned, plan for a steamboat.

At this point comes in an interesting story. Fulton and Livingston thought it proper and necessary, before launching their new boat upon western waterways, to write for permission to the governor of the new state of Louisiana. The fact that they did so would never have been known had it not been for the discovery of two small boys who went to play, a few years ago, in an unused loft in Galena, Illinois. There they came across a box containing papers yellowed by age. Some were written in French, and these they did not understand, but a few were in English, and the boys, fresh from school, recognized the well-known names Livingston and Fulton, when they saw them signed at the end of a letter. So they tucked that piece of paper into a pocket, and some time afterward,

when it came to light, they told a grown-up person about their find. He realized at once the value of the old papers and went in search of them, only to find that the loft had been cleaned since the boys' visit there and all the papers cast out and burned by some ignorant person who did not suspect their value. The documents and letters had belonged to a man who had been clerk under an early governor of the state. This letter shows how keenly Livingston and Fulton realized, in spite of doubters, the advantages which were sure to follow the establishment of steam navigation:

CLERMONT, STATE OF NEW YORK,

August 20th, 1810.

To his Excellency,

The Governor of Upper Mississippi;

SIR;

Wishing to extend the benefit of steamboat navigation to the Mississippi River, a capital approaching to two hundred thousand dollars will be required, which capital must be raised by subscription; but subscribers cannot be obtained until an effectual law presents a fair prospect of securing to them such exclusive right as will return emolument equal to the risk and trouble. In this point the patent law of the United States is at present imperfect, hence after the example of encouragement granted by the State of New York we have applied to the different governments bordering on the Mississippi for their protection and patronage and thus take the liberty to transmit to you our petition. To

improve the navigation of the Mississippi by transporting goods for three fourths of the sum which is now paid and in three fourths of the time; to render such an establishment periodical, uniform and secure is an object of such immense importance to the states bordering on the Mississippi, a work of so much labor and hazard to the undertakers as we hope will excite the most lively feelings of patronage and protection both in your Excellency and the Honourable, the Legislature of Upper Louisiana. On the receipt of these papers we shall esteem it a particular favor to be honored with an answer from your Excellency, expressing your opinion on this subject.

We have the honor to be respectfully,
Your Excellencies most obedient,

ROBT. R. LIVINGSTON.

ROBT. FULTON.

The interest of this letter prompts a warning to all lovers of history to keep any fragment of possible value; even if old papers have no charm for you, there is probably somebody searching somewhere for just the bit of information there recorded. Don't burn old papers merely because they are old. Read them and pass on their message.

But let us return to the story of Mr. Roosevelt. In 1809 he had married Miss Lydia Latrobe, of Baltimore, whom we must confess a brave bride. As soon as Fulton and Livingston had engaged Mr. Roosevelt's services, he went to Pittsburgh,

ordered a flat-boat to be built, and undertook the voyage to New Orleans to study the tides and river depths, and report their condition to Fulton so that he could decide whether a steamboat could make the journey down the long river against the strong currents.

Mr. Roosevelt did not travel alone, he took his young bride on the strange honey-moon trip. Flat-boats or rafts were quite common on the Mississippi. Mrs. Roosevelt has thus described theirs :

“There was a huge box containing a comfortable bedroom, dining-room, pantry, and a room in front for the crew, with a fireplace where the cooking was done. The top of the boat was flat, with seats and an awning. We had on board a pilot, three ‘hands’ and a man cook. We always stopped at night, lashing the boat to the shore. The rowboat was a large one, in which Mr. Roosevelt went out constantly with two or three men to ascertain the rapidity of the ripples or current.”

It was a six months’ voyage. Mr. Roosevelt carried letters of introduction to prominent citizens of Cincinnati, Louisville, and other cities, and found that these gentlemen listened with respectful attention to his account of the success of the *Clermont* on the Hudson River, but none would

encourage him to hope that a steamboat would prove a safe venture for the rapid current of the western river. However, Mr. Roosevelt took soundings of depths, made maps to show the position of sand-bars, and compiled a record of the swift flow of tides and of the general weather conditions. He was thought, as Fulton had been considered in New York, a mad enthusiast, whose plan would prove a total loss to any persons unwise enough to spend money in building a boat for the Mississippi.

They did not arrive at New Orleans until the first of December, from which port they took passage in a sailing vessel for New York. They had a hard voyage, for their captain fell sick and there was an outbreak of yellow fever on board. At Old Point Comfort they decided to leave the ship, and they made the remainder of the journey by stagecoach, arriving in New York about the middle of January.

We may imagine how eagerly Fulton and Livingston studied the charts and listened to Roosevelt's recital. The adverse criticisms of people living on the shores of the Mississippi were set aside by the facts noted by Mr. Roosevelt in his journal, or "log-book," of the strange voyage. Fulton's optimism was always ready to surmount any

barrier. It was agreed that Mr. Roosevelt should immediately return to Pittsburgh to superintend the building of the first steamboat for western waters. Fulton drew the plan, which was very different from those he had made for the Hudson River boats, because the conditions were so unlike those in the east. And he decided to make the steam engine much more powerful to cope with the heavy currents.

Under a bluff called Boyd's Hill, close to an iron foundry, the new boat, named the *New Orleans*, in honor of the city of her destination, was built. Timber was scarce and the ribs and beams for the hull had to be floated down stream from the upper forests. The local workmen could not understand the plan, and skilled ship-builders and machinists from Fulton's New York yards had to be sent to finish the work. This boat, like that on the Seine, suffered mishap, for one night a heavy freshet caused the water to rise, set afloat all the valuable timber and backed the whole ship-yard up stream. Not once, but several times, the high water threatened to launch the boat before she was ready. But perseverance conquers all, and finally the finished boat was successfully afloat upon the waters of the Ohio River.

History repeats itself, as the old adage says.

Again the scoffers gathered by the dock and river bank, laughed at the queer construction and predicted that the boat would never reach New Orleans.

When it became known that Mrs. Roosevelt intended to accompany her husband she was warned of her folly; indeed, Mr. Roosevelt was openly reproved for allowing his wife thus to imperil her life. The boat was supposed to carry passengers, but none appeared. Nevertheless, plans were carried out and during the autumn of 1811, on a bright October day, the *New Orleans* triumphantly steamed forth from Pittsburgh, in the presence of a great crowd of people. They cheered as the boat went *down* the river, but they openly prophesied that she could never come *up*!

From city to city the steamboat made its brave way. When, during the fourth night out, Louisville was reached in bright moonlight, the steam whistle aroused the sleeping town and the people hurried to the river, thinking that the comet of that year had fallen into the stream! When morning dawned and they could see that Mr. Roosevelt's promised steamboat had arrived, the citizens complimented his perseverance and gave a banquet in his honor. But they all agreed that the queer vessel never could go up the river against the current, no matter how successfully she could steam down.

So Mr. Roosevelt played a good joke on them. He invited a number of friends to a dinner in the cabin of the boat. While the feast was at its height, a strange rumbling brought the frightened guests to their feet; they rushed up on deck to discover that the boat had cast off from the dock, had turned in the river, and was actually steaming *up stream*, in spite of all their warnings that it never could!

After they had passed Louisville, while they waited for the water to rise high enough to pass through the rapids, Roosevelt took the time to turn the boat back as far as Cincinnati, to show doubters in that city that the feat was quite possible. The voyage through the rapids was exciting but the boat darted like an arrow through them and again accomplished the so-called "impossible."

The year 1811 was one of strange happenings. A comet blazed in the skies, a flood covered the lands in the valley, causing an epidemic of sickness, and earthquakes shook the whole region from the Missouri to the Gulf of Mexico. Small wonder that the Indians who lived in the forests along the Ohio and Mississippi paddled away in fright from the steamboat as it approached. They thought it was an evil thing.

The voyage came to an end, and a happy incident marked its close, for just before the steamboat

reached the city of New Orleans, a tiny passenger arrived on board to give it final blessing, for a little child was born to Mr. and Mrs. Roosevelt.

The boat was kept at New Orleans to use as a packet between that city and Natchez, but as pioneer it had proved the possibility for other steamboats to navigate the big river successfully, and they rapidly multiplied. Within twenty years after the voyage of the *New Orleans* hundreds of steam-propellers were paddling their easy way up and down the river. Steam navigation was a proved fact upon the Mississippi.

In this connection it is interesting to read the following extract from a letter Fulton wrote to his friend Thomas Jefferson, on April 7th, 1813. It outlines a still more extended system of steam navigation :

“I am not idle as to torpedoes but secrecy is necessary. When peace returns, or in four or five years from this date, I shall have a line of steamboats from Quebec to Mexico and to St. Mary’s; the route is up the St. Lawrence, over Lake Champlain, down the Hudson to Brunswick, cross the Delaware to Philadelphia; by land carriage to Pittsburgh, down the Ohio and Mississippi to Red River, up it to above Natchitoches: the total land carriage about five hundred miles, the other route to St. Mary’s land carriage not more than two hundred miles. The most of these boats are now constructing.”

CHAPTER XVII

FULTON'S HOME AND FULTON'S HONORS

WE have followed Fulton through widely different works, — art, canal navigation, the invention of the submarine torpedo and the steamboat. In 1814 he had reached almost the end of his busy and useful life.

Robert Fulton lived to be only fifty years old, — not the allotted “three score and ten” named by the Psalmist; yet during his half-century he accomplished infinitely more than many another does in a life full of years. To labor incessantly was his habit and pleasure. As he had written to Joel Barlow, “I cannot exist without a project, or projects, and I have two or three of the first order of sublimity.” Herein lay the secret, if such an openly admitted fact can be so termed, of his valuable life. He looked upon work as sublime; he exalted it to dignity; and its product to him was world-wide fame because of his world-wide service to humanity.

After his marriage, on January 7th, 1808, to

Miss Harriet Livingston, to whom you will remember his engagement was announced on the *Clermont*, they made their home in New York City, first at 100 Reade Street, then at 133 Chambers Street, where they moved in 1811, and the succeeding year, at Marketfield Place, opposite the Battery. The street now known as Battery Place was then called Marketfield Street; the Hudson River then flowed in as far as Washington Street and Battery Park extended only as far as Greenwich Street. Castle Garden occupied a tiny island connected with the mainland by a foot-bridge.

The foregoing addresses are given from the New York directories of those years, and some confusion regarding Fulton's last residence has arisen from the fact that Cadwallader Colden, who knew him well, says that he lived at number 1 State Street. In either case, his home commanded a superb outlook upon the harbor and river, and became a gathering place for his many distinguished friends. The outlook upon the dancing, sunny waters of the harbor must have been an inspiration and joy to the inventor of boats, — of this we may be sure. Works of art, in accord with Fulton's taste, abounded; and in the dining-room, the scene of much pleasant hospitality, was spread the dinner service of fine china, embossed with the coat of



HARRIET LIVINGSTON, WIFE OF ROBERT FULTON.



TWO OF FULTON'S CHILDREN.

Miniatures owned by C. Franklin Cray.

arms of the United States, presented to Fulton by Thomas Jefferson.

Mrs. Fulton was an accomplished harpist and when quiet evening hours closed the busy days, we may fancy her graceful form, with high-carved tortoise-shell comb surmounting her slender head, as she sat in the mellow light of the drawing-room, playing sweet melodies to the master of the house and their four little children, — Robert Barlow Fulton (named for Joel Barlow whose affection for Fulton never lessened) and the three daughters, Julia, Mary, and Cornelia Livingston Fulton, — bright, happy, companionable children who delighted the hearts of their parents.

Several excellent portraits exist of Robert Fulton, for he made a striking model for the many artists who were his friends; but in addition to that depicted, let us briefly consider his character, learned from those who knew and loved him in life; and from them we may gain the true likeness of the soul and mind of the man.

First we may think of Fulton as a good son, ever loyal and kind to his mother, providing a home for her old age and sending her gifts of money from time to time through many years, to provide her with comforts. His generosity included all who were of kin, for the letters quoted prove him mind-

ful of the welfare of his brother and sisters, though circumstances had carried him far from their sight.

He was a good friend as well, choosing his companions for their real worth, and his affection for them was faithful throughout his life.

He hated sham and falsehood and was brave enough to expose any make-believe in science. An example of this is shown in the following story. A man named Redheffer had earned much money in Philadelphia by exhibiting a machine which he claimed was run by perpetual motion. In 1813 one of these contrivances was brought to New York and advertised as a modern wonder. Crowds of people flocked to see it and paid a dollar entrance-fee.

The problem of perpetual motion had vexed the minds of scientists for many years. Fulton was unwilling to believe that its solution had been discovered, but his friends persuaded him to visit the house in the outskirts of the city where the machine was set up. He had not been long in the room when he exclaimed, "This machine has a crank motion."

The alarmed showman hastened forward with explanations, but Fulton, convinced he was right, openly denounced the affair as a fraud. His trained ear, as it listened to the wheels of the

mechanism, detected an uneven motion and he proclaimed to the audience that the thing was a cheat and he could prove it. He knocked away some woodwork concealing a string of catgut, which led along an upper wall to a distant attic where a poor old man, unkempt and half-starving, sat upon a stool and patiently turned, with weary hand, a crank.

The angry audience destroyed the machine, and the dishonest proprietor disappeared quickly. This ended Redheffer's false theory.

Mrs. Barlow, than whom none could know Fulton better, wrote to Mr. Colden, in reply to his question about Fulton's early life :

"Agreeable to your request I shall endeavor to give you the best information in my power respecting the early life of our excellent friend, Mr. Fulton. What is previous to 1797, when we became acquainted with him, was related by himself. He chose to have it known that he was self-educated and author of his own fortune, if I may so express it. During the summer of 1797, Mr. Fulton came to Paris to introduce his system (of canals) and get it patented. He came to lodge at a hotel where Mr. Barlow and myself were boarders. There commenced that strong affection and devoted friendship which subsisted between them in the most extraordinary degree as long as they lived.

We went into our own house soon after, when my husband invited Mr. Fulton to reside with us as long as we should remain in Paris. He resided in our family as a brother for seven years. During this period he learned the French language and something of the Italian and German; studied the higher mathematics, the sciences, physics, chemistry and perspective, and in short completed his education as far as it related to his useful elegant pursuits."

Mrs. Barlow quaintly says that Fulton's "genteel manners, companionable and amiable qualities, acquired him many valuable friends among the nobility and gentry." We may readily infer that not only did he choose his friends, but they chose him, because they found pleasure and profit in his company.

Mr. Colden describes him in these words: "Mr. Fulton was about six feet high; his person was slender but well proportioned and well formed. Nature had made him a gentleman and bestowed upon him ease and gracefulness. He had too much good sense for the least affectation; and a modest confidence in his own worth and talents gave him an unembarrassed deportment in all companies. His features were strong and of a manly beauty. He had large dark eyes and a projecting brow,

expressive of intelligence and thought. His temper was mild, and his disposition lively. He was fond of society, which he always enlivened by cheerful, cordial manners and instructed or pleased by his sensible conversation. He expressed himself with energy, fluency, and correctness, and as he owed more to his own experience and reflections than to books, his sentiments were often interesting from their originality.

“In his home he was kind, generous, and affectionate, and he gave freely of his money to charity, to entertaining friends at home, and to further his scientific plans. But conspicuous among his virtues were his calm constancy, his industry, and the untiring perseverance which helped him to overcome all difficulties.”

Another friend wrote: “Among a thousand individuals you might readily point out Robert Fulton. He was conspicuous for his gentlemanly bearing and freedom from embarrassment, for his extreme activity, his height, — somewhat over six feet, — his slender yet energetic form and well accommodated dress, for his full and curly dark brown hair, carelessly scattered over his forehead and falling around his neck. His complexion was fair, his forehead high, his eyes dark and penetrating, and revolving in capacious orbs of cavernous

depths; his brow was thick and evinced strength and determination; his nose was long and prominent, his mouth and lips were beautifully proportioned, giving the impress of eloquent utterance. Trifles were not calculated to impede him or damp his perseverance."

A story is told by a writer in the National Portrait Gallery about the establishment of the first ferry-boat across the East River to Brooklyn, and of a painful accident which happened during the second or third trip. Some trouble occurred with the machinery, and in an attempt to start the boat the chief engineer was caught in the wheels and so injured that he died from his wounds the following day. He was carried to the house next to the home of the writer, who recalled the conversation between Mr. Fulton and the attending surgeon. Fulton exclaimed, "Sir, I will give all I am worth to save the life of that man." When the doctor said his recovery was hopeless, Fulton turned aside, completely unmanned, and wept like a child. The neighbor truly observed that while no personal misfortune ever seemed to disturb Fulton's calm manner, yet his feeling toward other people was sensitive and tender.

Paul Sabbaton, who was chief engineer in Fulton's employ, wrote in later years, "I was so con-

stantly with Mr. Fulton, saw him at his occupation, at his family fireside, and in almost every situation, that I have to this day a most distinct and strongly impressed likeness on my mind. He had all the traits of a man with the gentleness of a child. I never heard him use ill words to any one of those employed under him no matter how strong the provocation might be, and I do know there was enough of that at times; and ever and anon, my mind recurs to the time when his labors were severe. His habit was, cane in hand, to walk up and down for hours. I see him now, in my mind's eye, with his white, loosely-tied cravat, his waistcoat unbuttoned, his ruffles waving from side to side, as his movements caused their movements; he, all the while in deep thought, scarcely noticing anything passing."

This agrees with the statement of another employee: "His workmen were always pleased to see him about the shops. With his rattan cane in hand, he always appeared to me the counterpart of an English nobleman."

By gathering these mind-pictures together we can form a composite likeness of a man who was great in small as well as in large affairs.

Let me add a story of my own recollection. About the year 1890 there came to Poughkeepsie,

New York, a blind Scotch woman ninety years of age. The infirm old lady was very fond of music and kindly members from the choir of the Church of the Holy Comforter would go to sing to her, for she was too feeble to attend church. When she heard the name of the rector of the church, Fulton's grandson, the Rev. Robert Fulton Crary, D.D., her face lighted with pleasure and she exclaimed, "His name, Fulton, is very dear to me." When asked the reason, she explained that during her childhood, her father, a boat-builder, employed at the New York ship-yards, purchased a small plot of ground adjoining a larger section owned by Robert Fulton. When the Scotchman came to build his home he found that his largest and best room could only gain sunshine by opening a window directly upon the line of Mr. Fulton's property. With fear and trembling he plucked up courage to ask this permission, which was so pleasantly granted that the bright, cheerful living-room was always called, in memory of that kindness, "Mr. Fulton's room." The wrinkled face of the old Scotch woman was aglow with the pleasure of the recollection, and the sunshine of that room still lingered even through her blinded eyes and the long life of many years. How few of us realize the far-reaching effect of a simple act of kindness.

Never very robust since that early outbreak of lung trouble, Fulton had worked to the full extent of his strength. When the accident occurred to his trial boat on the Seine, he imprudently dashed into the water to save the valuable machinery; and the labor of twenty-four hours, with neither rest nor refreshment, caused a constitutional weakness from which he never wholly recovered.

So keen was his interest in his work that when a new idea for some invention came to him he would pass the whole night in thought, following the resultant chain of ideas. In February of 1815 he went to Trenton, New Jersey, to testify in a lawsuit to protect the Livingston-Fulton rights in steam ferries, and while returning with his friend Mr. Emmet, a prominent lawyer, and Mr. John R. Livingston, he was obliged to wait a long time for the ferry-boat. Always eager to make use of spare moments, he decided to visit his ship-building yards to inspect the work upon his *Demologus*, the first war-vessel, and also to examine other boats he had sent there for repairs. He spent three hours at the works, and then with Mr. Emmet tried to walk across the ice formed at the riverside. Heavy rain had fallen, and this so weakened the ice that his companion fell through into the water. Greatly agitated, Mr. Fulton helped his friend up

and out, but both men were wet through by the quantity of water floating upon the ice. It was a very imprudent exposure and the natural penalty followed. Fulton took such a severe cold that he was confined to his room for several days. His great interest in the *Demologus* tempted him to venture upon an early carriage drive to the works; he took more cold, inflammation of the lungs followed, and on the morning of February 23d, 1815, he passed from this world to the life eternal.

Unusual tokens of public esteem followed the announcement. The legislature in session at Albany resolved that both Houses wear mourning, a testimonial never before accorded a private citizen. The newspapers of the day bore black columns; the Corporation of the City of New York, and literary and scientific associations, assembled to pass resolutions of sympathy. All members, wearing badges of mourning, attended his funeral at Trinity Church on the 25th of February. Minute guns were fired from his steam frigate and the West Battery, while the long procession, in which were officers of the National and State Governments, the Mayor and Common Council, and hosts of prominent citizens, wended its way from his late residence to the historic church, under

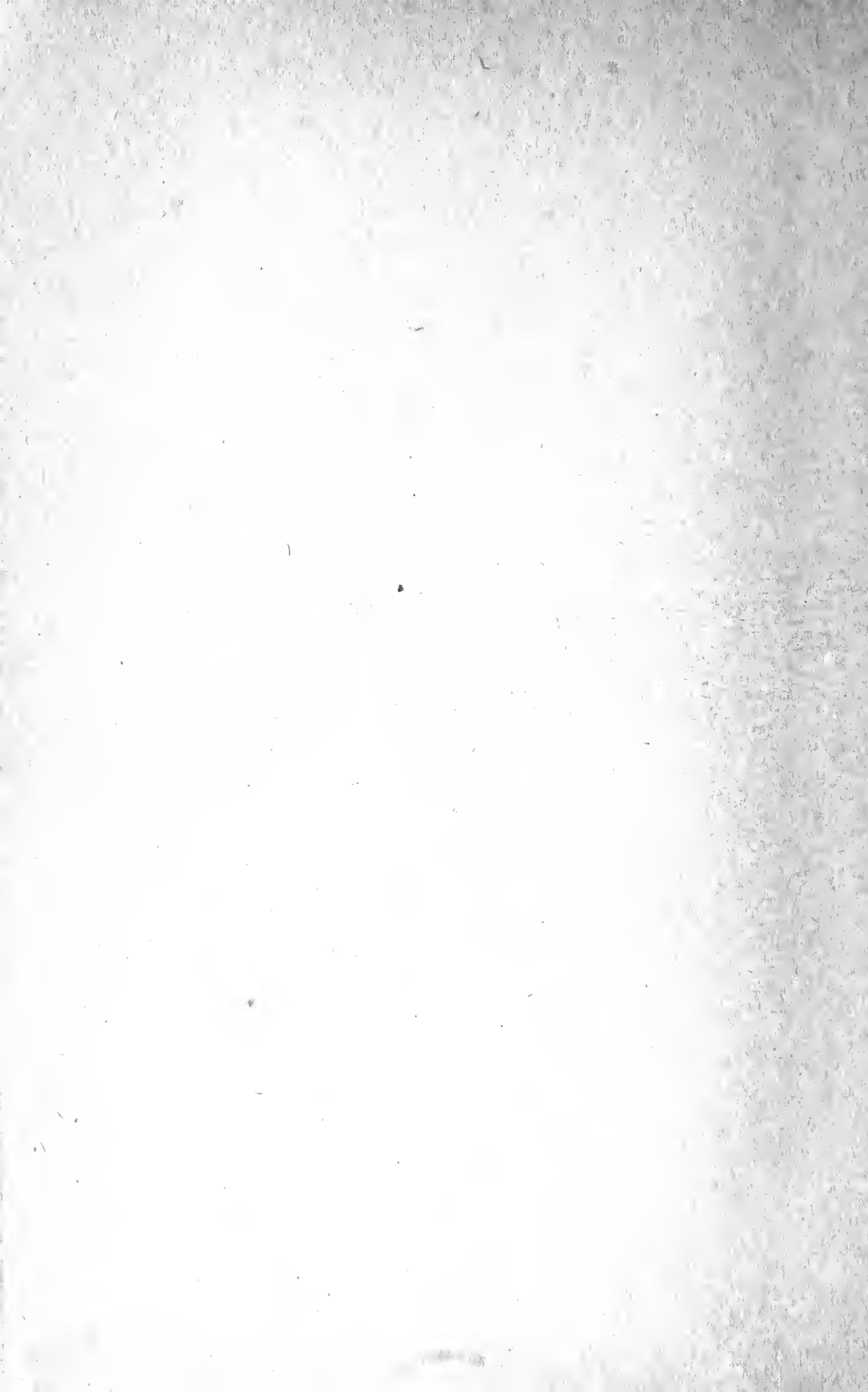
the shadow of which, in the vault of the Livingston family, his body was laid to rest.

The lad from Lancaster had earned high honor.
He sleeps near the river he loved so well.

Time-honored son, whose memory we revere,
Around the wondering earth thy lustrous name
Shone in old days, a sudden star of Fame,
Nor is that glamour dimmed. No leaves are sere
Among thy laurels. Greater seems each year
Thy priceless benefaction. Let them crown
Thy rare achievement with deserved renown
Who reap the guerdon of thy rich career!

Long hast thou passed the dark Lethean stream,
Yet who but envies that illustrious sleep?
Though thou art dust, yet vital is thy dream;
The waves of all the world still chant of thee:
Thy soul pervades the Ship and wings the Deep, —
Thy Spirit is immortal on the sea.

LLOYD MIFFLIN.



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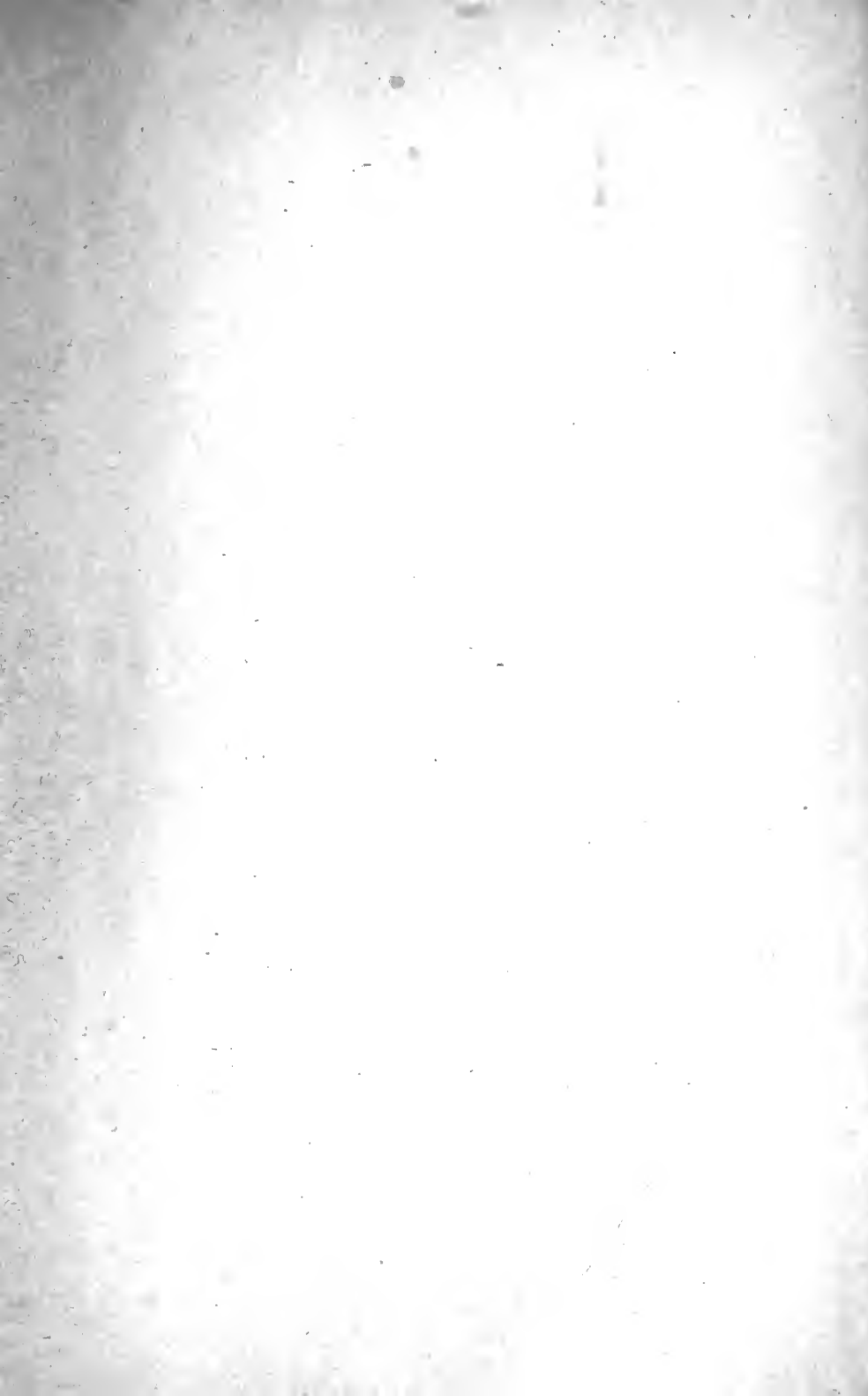
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